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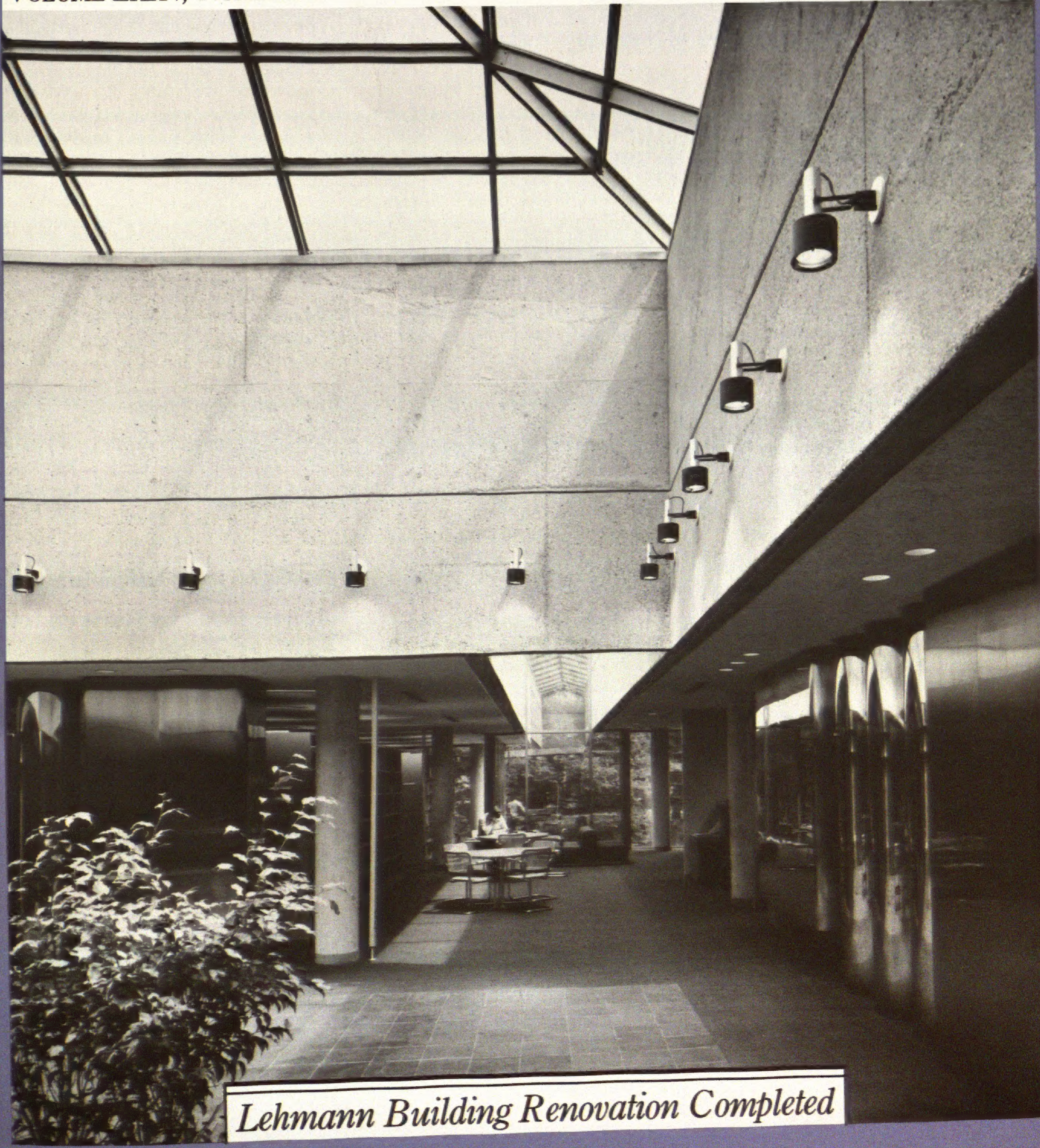

Lehmann Building Renovation Completed

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Comment

1986 — A Year of Accomplishment

The past year was a year of great accomplishment for the Missouri Botanical Garden. Many new things were added and some of the familiar ones got better. As we begin the new year it is appropriate to look back on 1986.

In research, we finished the renovation of the John S. Lehmann Building and rededicated it in October. The Lehmann Building is now completely devoted to research and offers fine facilities for our scientists and for those who visit from around the world. More details on this exciting project are found on the following pages. We were also able to enhance significantly our library collection with the addition of the 4,000 volume botanical historical collection of Dr. Joseph Ewan, the nation's foremost scholar in this area.

In horticulture, the grounds look only more and more beautiful each year. We have added two wonderful features that I'm sure you will enjoy come spring. The Kaeser Maze, a gift of the Piper Family, is just south of Tower Grove House and is an excellent accompaniment to the other historical features in that area. The Jenkins Daylily Garden is situated just north of the Victory statue and is a gift from Mrs. Ada Kling. This garden will allow us to show the many varieties of daylilies that are possible to grow in St. Louis. We were also able to add a wonderful wind chime to our Scented Garden for the Blind thanks to Mrs. Isabelle Zimmerman.

In education, the programs continue to grow and serve the community. We have focused this past year particularly on training teachers, thus multiplying the numbers of students on whom we might have an effect. Our program for older adults, the Soule Senior Citizen Center, has served a large constituency. We do mark with sadness the recent passing of Dr. Samuel D. Soule who was instrumental in developing the program.

The Members' Board worked hard this year with many events. Two of the most notable were the Garden Tour of private homes in June and a wonderful Halloween party in October. Both were triumphs in planning for the Members' Board and they were enjoyed by many Members.

We also had events for the public this year, and the one that delighted us all was the Japanese Festival. Not only was it cancelled, rescued and then more successful than ever, but it also gave us the opportunity to begin a relationship with the Fannie May Candies Company and its foundation, which has been a real pleasure for us.

While much more happened in this past year, I would be remiss if I didn't note that one of the highlights of the year was your support — the support that all of you give to the Garden. While financial support is always a necessity, we truly appreciate that you also give of your time to help us, and your advice and ideas to guide us.

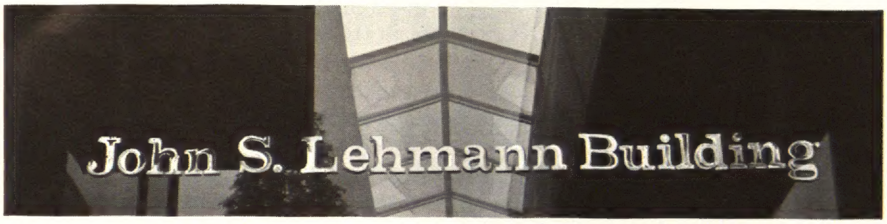
For all of that and for making 1986 a marvelous year, I thank you.

Peter H. Raven

Raven Goes to Geneva for Science Talks

Peter H. Raven, director of the Missouri Botanical Garden, was selected as one of six scientists to represent the United States at a preparatory conference in advance of a possible summit meeting. The international conference was held in Geneva, October 13 through 17, 1986.

The focus of the conference, sponsored by the Institut De La Vie, was "Science in the Service of Life: Global Problems." Attending was a small group of scientists drawn primarily from the United States and the Soviet Union. The program proposals resulting from this meeting were submitted immediately to President Ronald Reagan and Secretary General Mikhail Gorbachev for consideration during the summit.



READY TO MEET THE FUTURE

The John S. Lehmann Building, headquarters for the Garden's world-renowned research program, was rededicated in a ceremony on October 23. The building has undergone extensive renovation since the fall of 1985.

The $2.3 million renovation project included increased storage space, rearranged library space giving extra working room and shelving space, and building improvements such as a new roof.

When the Lehmann Building was dedicated in May of 1972, the herbarium contained a little over two million specimens, and the Garden's research staff consisted of five curators. Plant specimens were stored in movable cabinets, new to herbaria in the U.S., called compactors, which allowed many more specimens to be shelved in a given space than conventional cabinets. The new compactor units, six of them, had a total capacity of about three million specimens, so at that time the compactors were only about two-thirds full.

By the mid-1980s, the research staff had grown to about 30 botanists and the collection stood at more than three million specimens. Thus, the building was crowded for people and plants. With the completion of the Ridgway Center in 1982, some of the research program moved into the south wing of the Lehmann Building, formerly occupied by the education department, and this relieved some of the overcrowding in the herbarium area.

The recently completed renovation has increased the total storage capacity of the herbarium to about 4.25 million specimens, mainly through the addition of two large compactor units in the old auditorium area. Because the floor in the auditorium was stair-stepped and the ceiling was very high, it was possible to add a second floor within the original structure, and the two new compactors are located one above the other. These will be used to store specimens that have already been processed, mounted, and added to the permanent collection and to store specimens that are still in their newspapers from the field — those that are still being processed in one way or another before the mounting process.

The remainder of the south wing of the Lehmann Building has been converted into offices and herbarium processing areas, including a very large area custom-designed for the plant mounting staff, which has grown from one in the early 1970s to the current eight.

The arrangement of the new rooms in

continued

Dr. Peter Hoch, left, showing visitors how plant specimens are stored in the herbarium.

A new, enlarged circulation desk in the library was part of the renovation.

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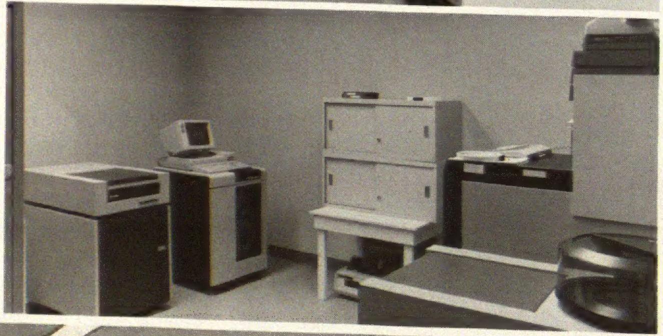
GARDEN LIBRARY

Mrs. Anne L. Lehmann addressing the group assembled for the rededication ceremony on October 23. A portrait of John S. Lehmann hangs in the background.

On the Cover — The library in the John S. Lehmann Building.

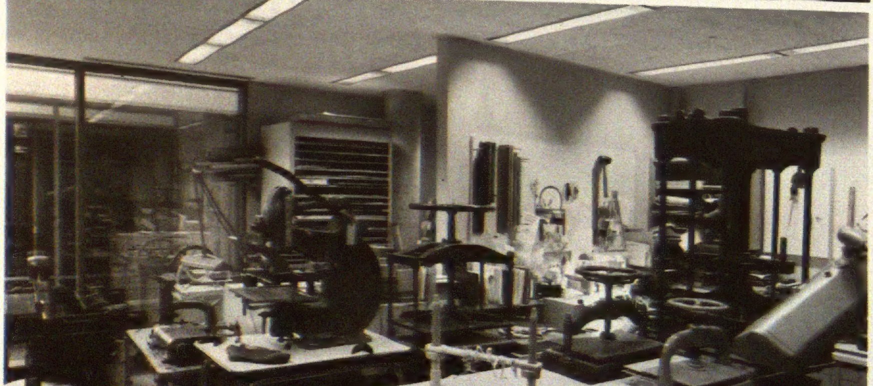
The expanded plant mounting area in the old education wing.

Dr. Marshall Crosby with new compactor storage unit in lower level of old auditorium area.



A specially insulated and air conditioned room houses the Garden's computer equipment.

(Below) The Shoenberg Conservation Center is capable of restoring the library's rare books.



the south wing is such that newly arriving plants come immediately into a receiving area where they are sterilized with heat to kill any insects or insect eggs that may have come with them from the field, then moved to the plant mounting area. They may then go directly into the compactor storage, located now on the original lower level and in the old auditorium.

The addition of this new storage means that the collection can continue to grow over the next several years without danger of overcrowding in the compactors, which often results in damage to the specimens. The office areas in the lower level, occupied by the herbarium, have also been reconfigured to provide additional office space for curators and support staff. A new compactor has also been added to the lower level, further increasing storage capacity of the collection.

The addition of the new compactors and the reconfiguration of spaces are the conspicuous parts of the renovation, but much has also gone on behind the scenes that greatly increases the efficiency of the installation. For example, a new roof has been added to the building, eliminating the increasing problem of leaks through the original roof, which was designed for a ten-year life span. The air conditioning and heating (HVAC) system has been upgraded through the installation of an energy management system that will increase the efficiency of the building tremendously.

With the greatly expanded use of computers in the research area, each office is now provided with built-in plugs for computer terminals, which run directly to the central computer now housed in the middle of the building in a specially insulated and air-conditioned room. This room also contains the word processing unit, which is also wired directly to the various areas of the building that make use of this computer.

As originally designed and built, the interior of the building was beautifully finished. The newly renovated interior areas have been designed and built to harmonize with the original interior, though in many instances newer technologies have been applied.

The building is named in honor of John S. Lehmann who was president of the Board of Trustees from 1953 to 1958 and who served as a Trustee for 27 years, from 1940 to 1967. He, along with his wife Anne L. Lehmann, who is a Trustee Emeritus, have contributed greatly of their time, energy and resources to build the Missouri Botanical Garden into a valuable asset for the community, the nation, and the world.

Interview/Enrique Forero

New Director of Research

AS REPORTED in the last issue of the Bulletin, *Dr. Enrique Forero, a professor at the Institute of Natural Sciences, National University of Colombia, Bogotá, has been appointed the new director of the Garden's botanical research program. The following interview, conducted shortly after his arrival in St. Louis, offers an interesting perspective of the Garden's research activities.*

Now that you've had a chance to get settled, what is your overall impression of St. Louis and the Missouri Botanical Garden?

For anyone who comes here, from anywhere in the world, it is a very impressive institution in all respects. The gardens themselves are very nicely organized, very appealing to the eye. But what interests me most is the research program.

How do you rate the Garden's research program?

Coming from Latin America and having a good idea of what other institutions do in Latin America, both Latin American institutions and U.S. and European institutions working in Latin America, there is no doubt in my mind that this is really the world's premiere research program in tropical botany. The results are measured in the number of publications, the growth of our herbarium and the activities that our staff carry out in different countries. These activities involve field work, teaching courses, working with the local people, consulting collections, giving lectures and interacting with scientists from all over the world, including Latin America, Africa, and China.

You've traveled quite a bit and seen other institutions' physical facilities, how do the Garden's research facilities compare to the working environment of other places?

I am glad you asked this question. You may think that because I'm working here now I would say only nice things about the Garden, but it's true. The working facilities here for the research scientists, are very good, probably the best in the world, in fact. We have everything we need. We have one of the best botanical libraries in the world right here. We have one of the best herbaria in the world. We have comfortable offices, enough equipment. We are working with computers all the time. Everyone basically does his or her work now on computers. I mention this because, as you say, I've been in many places and I know there are many people who don't even think about having a computer. Often they don't even have a microscope to work with or have only a very old one. But I have also been in institutions, very large, important institutions in the "developed" world, which don't have some of these basic facilities, don't even have enough room to work. They do their work and they do it well, but they don't have as many facilities as we do. This is probably one of the the best facilities in which to do the work that we are trying to do.

What do you think are the most prominent strengths of our research program?

I think the most prominent strength of the program is the field work that we do. For example, of the approximately 30 Ph.D. level researchers on staff, you rarely find more than a dozen here at the Garden at one time. That is because the rest are in the field doing what they are supposed to be doing--collecting plants, studying the vegetation and working with other people in local research projects in the tropics.

We are also quite involved in training, but that is something that we need to work on more and are now trying to emphasize as much as we can. And that is something that we have to do. We have the best

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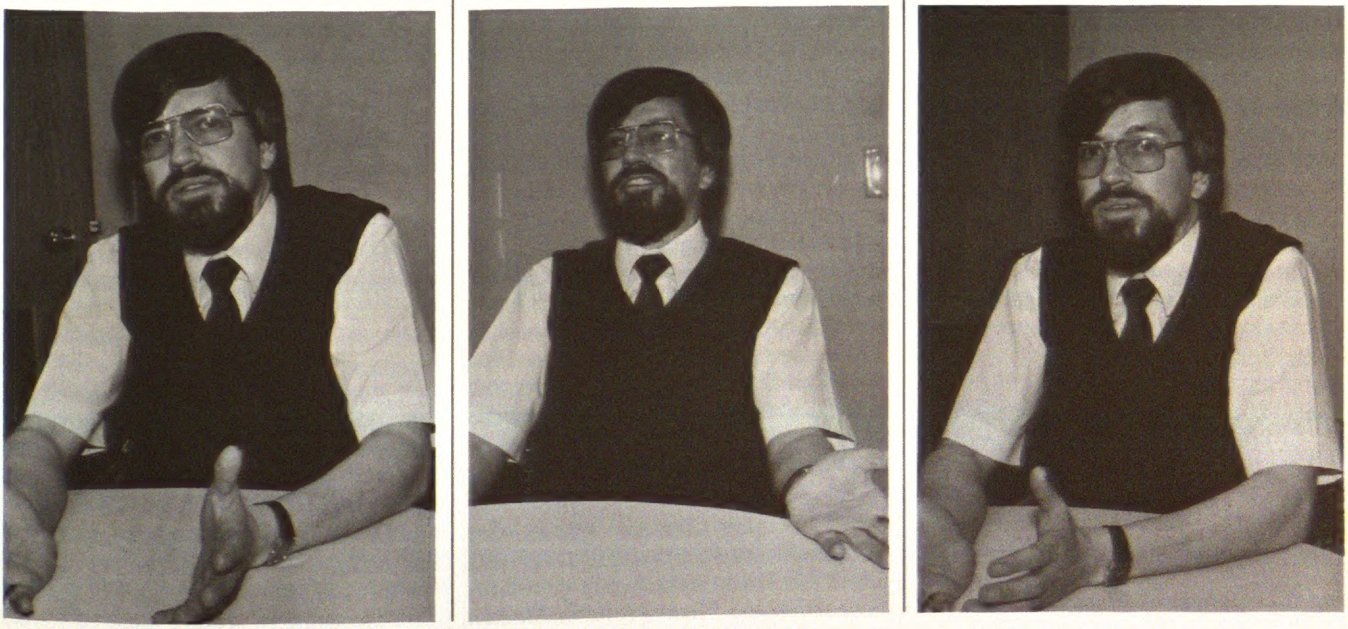


Dr. Forero

facilities, we have the best people and we have to share that with the rest of the world. The best way to share some of these things is by training other people and the need for trained botanists in tropical countries is acute.

By training do you mean sending our staff to other countries to work with the local scientists and the local governments?

Yes, one way is by being there and actually doing the training there, but the other way is by bringing people here from other countries and even from within the United States, to train them in the things that we do — plant taxonomy, herbarium management, field techniques, computer techniques, methods. All the things that we do all the time. Our everyday procedures are, for many people, new things, so we have to actually show them. Just being here for a month is very important because you see what is being done and how it is being done.

Do you have any plans for immediate changes in that area?

Not really. All I would like to do in the near future is look at what has been done and try to organize some of the programs in order to make them even more efficient. I want to see which areas need more input, which countries need more help, where are the people that we actually want to train. I have a good feeling for what is happening in Latin America but we also have people who have a good feeling for what is happening in Africa.

In regards to training, I want to get involved with the graduate program here as a professor. You know that many staff members are adjunct professors at one of the local universities and my appointment as adjunct professor has just been suggested to the universities. It is something that will take some time, but I do expect to get involved in graduate teaching here myself.

Being in an administrative position as I am now, my experience tells me that one of the ways in which I can keep in touch with botanical research is through my students. I may be signing papers and writing proposals but if I have students there asking me questions, I have to go back and look at the plants and read the books and keep up with it so I can actually talk to my students. I feel that is very important for me.

Where do you see the Garden's research program going in the future?

Well, that is something difficult for me to answer right now because I don't have all the facts. But I think it will continue to grow. We may have more people here or more projects going on in different places. What we are doing is so important and so urgent, studying the flora of the world before it disappears. We are even involved in programs that have to do with practical use of plants, like cancer research. We will continue to grow. There is no doubt about that.

Also I think, and this is one of the important things as far as I am concerned, we will increase our already flourishing cooperation with institutions in other countries, especially in developing countries--in the tropical regions of the world and particularly in Africa and Latin America, which means that we will play a very important role in the development of botany in all these countries. That is what we want to do and that is, I think, what many people are looking forward to doing. Both from here and from there.

We are trying to do the job as fast as possible and as well as possible because if we don't do it now, no one is going to do it for us. We can't do it by ourselves. It's too much. So we have to work with other people, and that's what we are working on. We are looking forward to increased collaboration with these institutions. Institution building in the developing countries is one of the important objectives of my presence here and it is really one of the things the director wants to do and the curators are interested in doing as well. It is nothing that I have invented, but it is something with which I can help.

Was it a difficult decision to move to St. Louis?

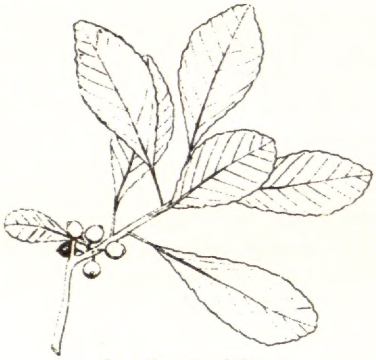
My coming here was not an easy decision. I am very much involved with Latin American botany and to tell my colleagues and friends in Latin America that I was leaving, coming to the United States, was not an easy decision and it was not easy to explain to them why I was coming. I think it was something that had to be done and, fortunately, they understood that there were good reasons behind it and one of the good reasons is that our collaboration will increase. They will have someone to talk to here, someone they know. Someone they are comfortable with, familiar with, who speaks their own language. They hope and I hope, and the Garden hopes that this will increase communication and increase collaboration.

The Missouri Botanical Garden has the largest membership of any botanical institution in the world. Is there anything the Members can do, or should be particularly aware of, to aid you and the staff in carrying out this research program?

I would say that probably one of the most important things our Members should be aware of is the importance of the kind of work we do. Tropical forests are very rich, not only in number of species, but in plants of promising economic value. Plants protect watersheds. Plants give us food, give us shelter and give us almost anything you can think of. If we destroy the plants we are destroying ourselves. We will not be leaving anything for our children. Even though we are here in the United States, a lot of the things we use every day come from the tropics. Not only the United States, but the world in general depends and will depend more and more on what is produced in these countries and from the potential that these countries have, not only in plants, but in all kinds of different things.

If we are able to explain to our Members that it is important that we study tropical plants because they are being destroyed and we can tell people how to manage them best, then they will be a great help because they can transmit that to other people. We want to spread the word around that it is important to keep natural vegetation, to protect it as much as we can, to manage it, to use it as best we can. We are not saying that we are going to protect the forests just so we can look at them. There is no point in doing that. We are going to protect them so we can use them and they can also serve us.

Carolina Buckthorn and Possum Haw



Carolina Buckthorn

Possum Haw

Many species of native trees suitable for landscape designs are often overlooked. Having grown in Missouri for thousands of years, they are adapted to the extremes of temperature and drought that occur here. Three species of small trees which are interesting in the landscape and produce food for birds are the Carolina buckthorn and possum haw described in this article, and the gum bumelia, described in the November-December, 1985 *Bulletin*.

Carolina buckthorn, *Rhamnus caroliniana*, is the most common of the three at the Arboretum. Being an understory tree, it is found on the edges of woods and in openings in the woods. It is very drought-resistant and is found also on glades and edges of glades. The dark green, shiny leaves are very attractive as are the berries which turn from green to red to black as the seasons progress. Carolina buckthorn is native to the southern United States and north into Missouri, and therefore is best planted in a somewhat sheltered location in this part of its range. The pea-sized fruit is edible, though not very tasty, and contains three small dark seeds. The Carolina buckthorn, also called indian cherry, is a thornless member of the buckthorn family, Rhamnaceae.

The possum haw, *Ilex decidua*, a member of the holly family, is also called deciduous holly because, unlike its relative, the American holly, it loses its leaves in the fall. "Male" and "female" flowers grow on separate trees, so pistillate ("female") trees must be planted to obtain the bright red berries which are the chief attraction of this tree. Although primarily a bottomland species, it is found in many dry upland sites at the Arboretum. A striking mass planting of this shrublike tree was installed in 1976 along the stairway leading to the Trail House. In ten years, this relatively fast-growing tree has created a beautiful arch covered with red berries over the stairs. These berries have been found to contain chemicals called aldehydes which make them unpalatable until a sufficient period of cold weather changes the aldehydes to sugars. In late winter the edible berries provide food for birds at a time when food is scarce.

Birds play an important role in disseminating seeds of various trees, especially those bearing fleshy fruits like the possum haw and Carolina buckthorn. The fleshy part entices birds to eat the whole fruit, including the seeds. The undigested seeds pass through their bodies and thus are distributed over the landscape. This strategy is in marked contrast to those trees having winged fruit, such as maples and pines, which are carried by the wind. This partnership between birds and trees was nicely described by Henry David Thoreau in his essay "The Succession of Forest Trees": *Thus, though these seeds are not provided with vegetable wings, nature has impelled the thrush tribe to take them into their bills and fly away with them; and they are winged in another sense, and more effectually than the seeds of pines, for these are carried even against the wind.*

— William A. Davit

WILLIAM L. BROWN RECEIVES HENRY SHAW MEDAL

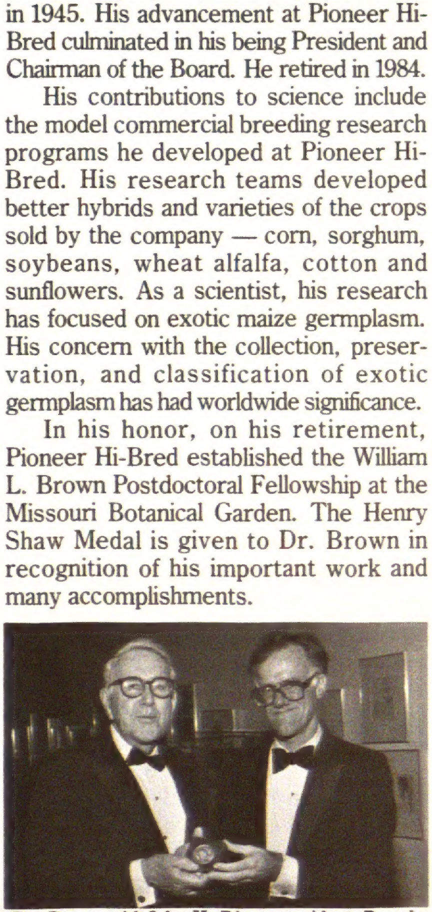
The Missouri Botanical Garden's 1986 Henry Shaw Medal was presented to William L. Brown on November 17. The presentation was part of the annual dinner for Garden Fellows and Henry Shaw Associates, the leading supporters of the Garden.

The Henry Shaw Medal has been awarded intermittently since 1893. It honors those who have made a significant contribution to the Missouri Botanical Garden, botanical research, horticulture, conservation, or the museum community.

William L. Brown has achieved in both business and science. In 1937 he became a Research Fellow at Missouri Botanical Garden and during the next four years he earned M.S. and Ph.D. degrees from Washington University. After working for the U.S. Department of Agriculture and a seed company, he joined Pioneer Hi-Bred in 1945. His advancement at Pioneer Hi-Bred culminated in his being President and Chairman of the Board. He retired in 1984.

His contributions to science include the model commercial breeding research programs he developed at Pioneer Hi-Bred. His research teams developed better hybrids and varieties of the crops sold by the company — corn, sorghum, soybeans, wheat alfalfa, cotton and sunflowers. As a scientist, his research has focused on exotic maize germplasm. His concern with the collection, preservation, and classification of exotic germplasm has had worldwide significance.

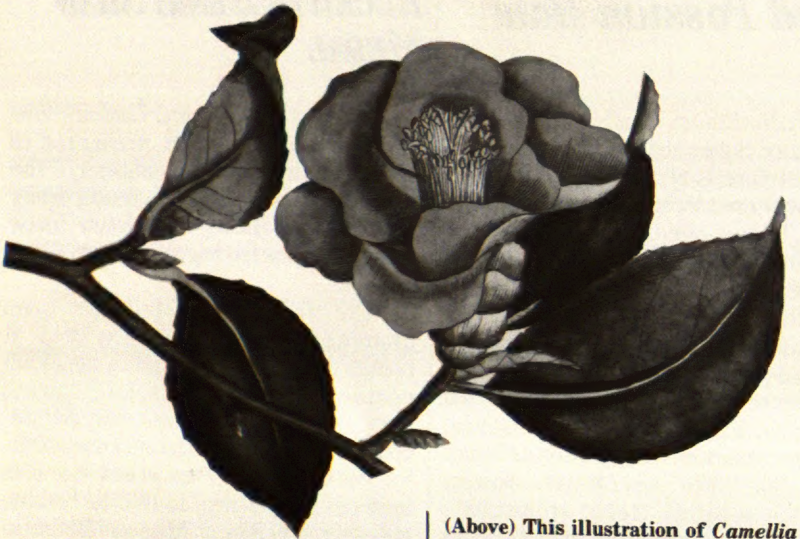
In his honor, on his retirement, Pioneer Hi-Bred established the William L. Brown Postdoctoral Fellowship at the Missouri Botanical Garden. The Henry Shaw Medal is given to Dr. Brown in recognition of his important work and many accomplishments.



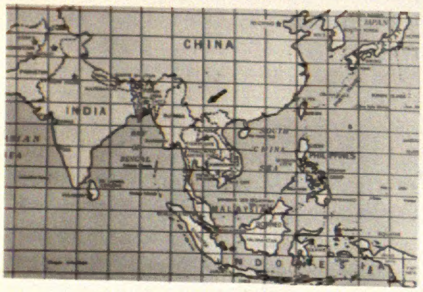
Dr. Brown with John H. Biggs, president, Board of Trustees.

Gardening at the Garden

Camellias



(Above) This illustration of *Camellia japonica* in *Curtis's Botanical Magazine* (1788) is said to have helped introduce camellias to Europeans.



(At left) Home area for *Camellia*. Arrow points to Kunming region, Yunnan, China.

CAMELLIAS are members of the Tea Family (Theaceae) along with such other ornamental genera as *Stewartia*, *Gordonia*, and *Franklinia*. All of these are shrubs or trees with large, round, showy flowers having separate or nearly separate petals and, to the inside of these, a brushy cluster of stamens (the organs that produce pollen). While the three genera listed above are partly or completely native to the southern United States, *Camellia* is almost limited to southern China, although a few species are found in India, Malaysia, Borneo, Korea, and Japan. The genus is made up of some 200 species, only three of which are grown extensively as ornamentals in warm regions: *Camellia japonica*, *Camellia reticulata*, and *Camellia sasanqua*.

Wild *Camellia japonica* was thought, until recently, to be confined to Japan, so the presence of this species in China was assumed to stem from early horticultural activity. In 1979, however, a Chinese botanist, Huang Tehling, announced the discovery of wild *Camellia japonica* in Sichuan Province, China. He suggested that cultivars previously believed to have originated from Japanese stock may trace back instead to Chinese beginnings.

With thousands of cultivated varieties, *Camellia japonica* is unquestionably the leading species in horticulture. Its history in Japanese and Chinese gardens spans no fewer than 1,000 years and it was the first species cultivated in the West.

Known as *"Tai Pai"* (Great White) and dating back to the Sung Dynasty (around 1000 A.D.) in China, *Camellia japonica* 'Alba Plena' is one of two cultivars that helped launch camellias as cultivated favorites in Europe. In 1788, the painting of *Camellia japonica* used to illustrate the present article appeared in a British magazine and there helped stir up the considerable demand that greeted the importation of *Camellia japonica* 'Alba Plena' by the British East India Company in 1792. Demand never died — it remains popular almost 200 years later. Be sure to spot this living antique in the Linnean House at the Garden.

During the late eighteenth century and early nineteenth century numerous cultivars followed 'Alba Plena' from China while Europeans developed still others from *Camellia japonica*. By about 1820 horticultural interest in camellias had grown enough to support a commercial nursery devoted to them in London opened by Alfred Chandler. One of Mr. Chandler's first successes, the persistently popular *Camellia japonica* 'Elegans (Chandler)', is ancestral to several modern cultivars, including *Camellia japonica* 'C.M. Wilson', which can be seen in the Linnean House along with 'Elegans (Chandler)'.

As the nineteenth century progressed, camellias gained in popularity until a "*Camellia* craze" crashed in an abrupt decline in enthusiasm in Europe around 1870. Their popularity continued in the United States, where *Camellia japonica* was the beloved *Camellia* (or "japonica") of the Southeast.

To turn to a different species, the floral emblem of Yunnan Province in central southern China, *Camellia reticulata*, occurs wild at mountain elevations sometimes exceeding 10,000 feet. *Camellia reticulata* was in cultivation as early as the year 900, and 72 cultivars were recorded by the eleventh century with many "new" ones appearing later. Most perished in a series of wars.

Until modern times almost all of the "reticulata" cultivars existed only in Yunnan, mostly in monasteries and private gardens in the area around Kunming, although plants of this species were transported to other cities for their festive red flowers used in New Year's decorations. Before 1948, *Camellia reticulata* was represented in the West by virtually only two cultivars: 'Captain Rawes' (introduced in 1820) and 'Pagoda' (formerly known as 'Flore Pleno' and introduced in 1857). After a series of Chinese botanists revived and spread interest in *Camellia reticulata* during the middle portion of the twentieth century, horticulturists in the United States responded enthusiastically with the introduction of 14 cultivars in 1948. Three of these are displayed in the Linnean House: 'Cornelian', 'Crimson Robe', and 'Shot Silk'. Presently, slightly over half of

A COLORFUL CURE FOR THE LATE WINTER BLUES

Success

Garden horticulturist Mary Smith inspects the outcome of her research and late-night visits to the lily pools. She produced seeds by pollinating two *Victoria* water lily flowers, an accomplishment that required looking into the biology of these very odd flowers, which are normally pollinated by beetles on hot South American nights. The Garden's legendary giant waterlilies are started from seed each year, and in the past it was necessary to have the seeds shipped here from elsewhere. Thanks to Mary, this will no longer be so.

the 105 cultivars known from Yunnan are grown outside of China.

Outstanding characteristics of *Camellia reticulata* are large floral size, bright coloration, and a long blooming period. Individuals can grow into trees over 60 feet tall. Spectacular and still relatively new on the scene, *Camellia reticulata* will no doubt grow in popularity and shine forth in future *Camellia* crosses.

Restrictive trading policies prevented the preferred ornamental *Camellia* in Japan, *Camellia sasanqua*, from reaching western gardens until a little over a century ago. The natural range of this species is southern coastal Japan and islands southward to Okinawa.

Like the other major cultivated species, *Camellia sasanqua* has an ancient horticultural history, not only on account of its beauty, but also as a source of oil and as an inferior grade of tea. In fact, the name "*sasanqua*" comes from Japanese, "*sazankwa,*" which means "plum-flowered tea." This species adapts well to pruning and training, and it grows well in containers, as you can see by finding four hanging baskets containing the cultivar 'Mine-No-Yuki' in the Linnean House. A second cultivar that you might see there, 'Yuletide', begins flowering before Christmas and continues until spring.

Having a comparatively delicate structure and fragrant flowers, *Camellia sasanqua* has been used in crosses with *Camellia japonica.*

Involvement of camellias in human affairs extends beyond decoration. It may come as a surprise, for instance, to learn that tea comes from a member of the genus, *Camellia sinensis.* Tea is thought to have originated in and possibly around Burma; however, thousands of years of cultivation have obscured its original distribution. India and Sri Lanka (Ceylon) are the greatest tea-exporting countries, and large quantities are grown in China mostly for consumption there. Tea is a minor crop in South America.

The beverage is made from the youngest foliage. For black teas this is withered, chopped or torn apart, fermented, then dried. For green teas the young leaves are dried right after picking. Waste from the process is useful as a commercial source of caffeine. Quality of teas is determined by professional tasters who can develop remarkable sensitivity to subtleties in the flavor — some tasters can recognize the region and time of harvest of a sample. A tea plant is displayed in the Linnean House.

A less familiar use for *Camellia* is as a source of oil. Employed historically for lamps, heating, cooking, medicinal applications, and dressing hair, *Camellia* oil is pressed from the seeds of all of the commonly cultivated species. Especially *Camellia japonica* and *Camellia oleifera* (its name meaning "oil-bearing") are oil crops in Japan and China. *Camellia oleifera* is a new addition to the Linnean House this winter.

Camellias appear frequently in Chinese and Japanese symbolism. The small sampling that follows will help illustrate the diversity of meanings connected with them.

Samurai warriors in Japan variously regarded *Camellia* flowers as symbols of beheading (bright red and falling from the stem as if cut), warlike spirit, fair play, and purpose. Samurai weapons are sometimes decorated with *Camellia* patterns.

Taking a year to open, *Camellia* buds in parts of China represent a long wait for a son. For this reason Chinese women avoided wearing them.

In tea ceremonies *Camellia* flowers represent longevity, friendship, elegance, and harmony (and don't forget that in tea ceremonies *Camellia* is the main course). Similarly, in Yunnan, friends exchange flowers from *Camellia reticulata* as symbols of longevity and prosperity.

Buddhist priests in certain regions carried *Camellia* rods attributed with the power to drive away evil.

Altogether there are about 50 different camellias in the Linnean House diverse in size, color, floral form, and history. Some have distinguished pasts in China or Japan (in addition to those already mentioned, you may enjoy finding *Camellia japonica* 'Magnoliaeflora', which was grown in Japan as long ago as 1695). Others are old European favorites. Examples not already mentioned include *Camellia japonica* 'Adolphe Audusson', a renowned French cultivar dating from 1877, and *Camellia japonica* 'Nobilissima' from Belgium in 1834.

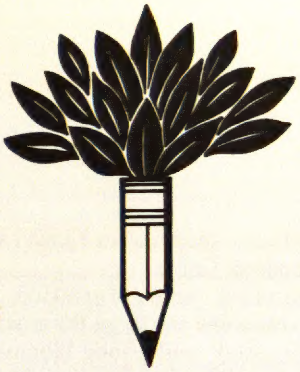
Beyond the "reticulatas" listed above, a few of our cultivars have been introduced from Japan or China in fairly recent years. For example, *Camellia japonica* 'Julia France' came from Japan in 1958, and 'Pink Herme' came from the same species and the same country in 1930. Most of the others are European or American developments from the present century. One, *Camellia japonica* 'Mrs. D. W. Davis Descanso' appeared as a sport in California during 1970.

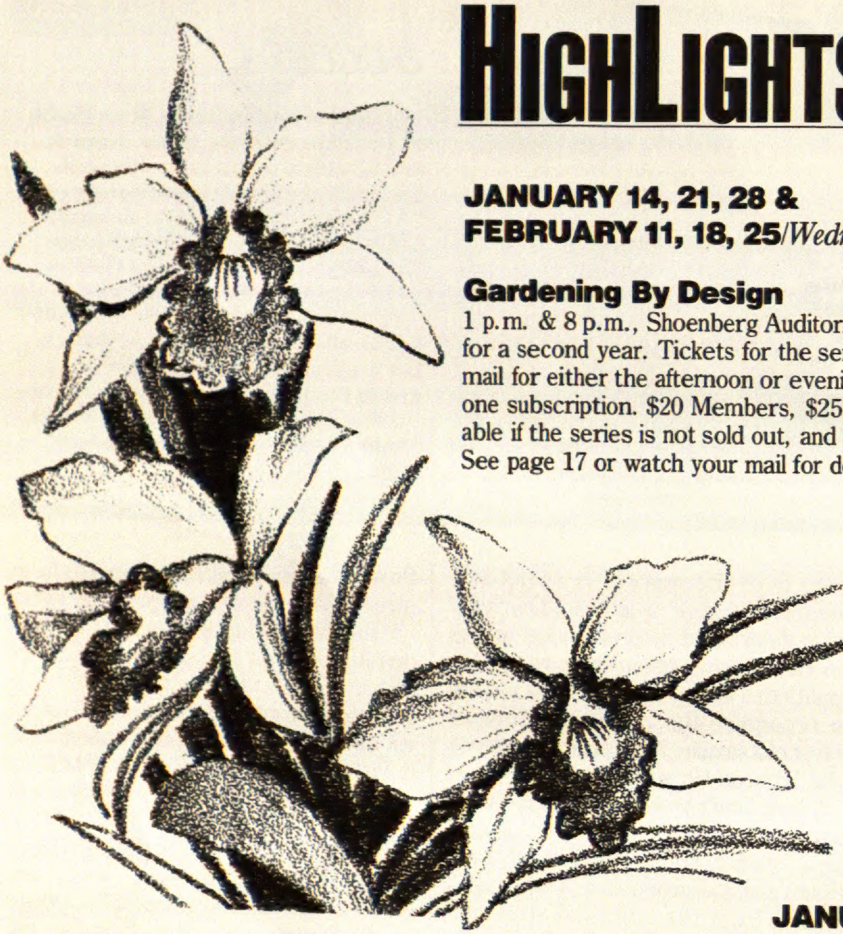
The peak flowering period at the Garden varies from year to year but generally can be expected from mid-January through February. I suggest calling ahead and then visiting the Linnean House to enjoy a showy and historically captivating collection.

— George K. Rogers
Horticultural Taxonomist

JANUARY - FEBRUARY

HIGHLIGHTS





JANUARY 14, 21, 28 & FEBRUARY 11, 18, 25/*Wednesdays*

Gardening By Design

1 p.m. & 8 p.m., Shoenberg Auditorium. Immensely popular lecture series returns for a second year. Tickets for the series will be sold by subscription through the mail for either the afternoon or evening sessions only. Tickets may not be mixed in one subscription. $20 Members, $25 non-members. Single tickets will only be available if the series is not sold out, and then only the day of the lecture at the door. See page 17 or watch your mail for details.

JANUARY 24 thru APRIL 5

Orchid Show

9 a.m. - 5 p.m., daily, Orthwein Floral Hall. The French Quarter of New Orleans is the backdrop of the spectacular annual orchid show. Members Only preview showing Friday, January 23.

JANUARY 24 thru FEBRUARY 28

Spirits of the Rain Forest

9 a.m. - 5 p.m., daily, Monsanto Hall. Deep in the Amazon rain forest of northern Brazil and southern Venezuela lives an Amerindian group called the Yanamomo who, until the 1950s, were unknown to the outside world. This exhibit of photographs, drawings and artifacts captures the Yanamomo's view of the world. The exhibit partially funded by the Missouri Arts Council.

JANUARY 31 thru FEBRUARY 8

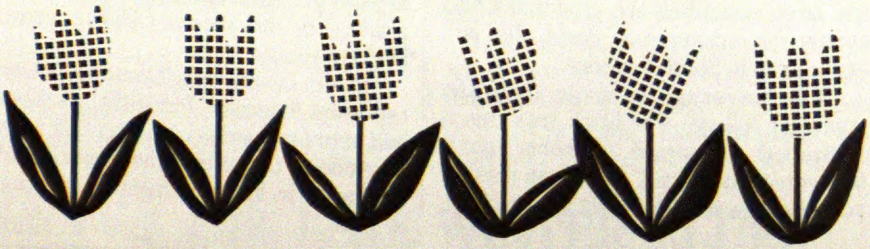
Botany Field Days

9 a.m. - 5 p.m., daily, Ridgway Center, Lehmann Building and Climatron. Get a closer look at the Garden's research program during this nine-day event. Tour the Herbarium where 3.5 million plant specimens are housed, see the Garden's extensive library and visit the tropics in the Climatron. Explore the fascinating world of plants through materials readily available in your local grocery store. Films, lectures, demonstrations and more. Free. Call 577-5125 for more information.

FEBRUARY 28 & MARCH 1/*Saturday & Sunday*

Spring Gardening Fair

9 a.m. - 5 p.m., Sat. & Sun., Ridgway Center. Experts will present lectures and exhibits on lawn care, plants, seeds, equipment, landscaping and garden design. Advance registration required for lectures. Call 577-5125 after January 26 for details. Co-sponsored with the St. Louis Post-Dispatch.



JANUARY - FEBRUARY

DAY-BY-DAY

JANUARY

1
New Year's Day
9 a.m. - 5 p.m., Thurs. Start the new year right with a visit to the Garden.

1-4
Holiday Flower Show
9 a.m. - 5 p.m., Thurs. - Sun., Orthwein Floral Hall and Monsanto Hall. Your last chance to see the magnificent Holiday Flower Show and Tree Exhibit, sponsored by Citicorp.

8-10
Inventory Clearance Sale
9 a.m. - 5 p.m., Thurs. - Sat., Garden Gate Shop. Members save 20% on all regularly priced merchandise, including plants. Seasonal and Christmas items will be available at special low prices for clearance.

14
Gardening By Design
1 p.m. & 8 p.m., Wed., Shoenberg Auditorium. John Floyd, editorial director, Southern Accents magazine: "Making Your Home Landscape Fit." (*See Highlights.)*

18
Members' Only Climatron Tour
1 - 3 p.m., Sun., Climatron. A special tour led by the Garden Guides. Master Gardeners will also be on hand to answer your tropical plant questions.

21
Gardening By Design
1 p.m. & 8 p.m., Wed.,Shoenberg Auditorium. Doug Gilberg, owner, Gilberg Perennial Farms: "Shade Gardening With Perennials." (*See Highlights.)*

23
Orchid Show Members' Preview
5 p.m. - 8 p.m., Fri., Orthwein Floral Hall. Preview this year's spectacular show.

24
Orchid Show
9 a.m. - 5 p.m., daily. Orthwein Floral Hall. Immensely popular show, this year featuring a New Orleans theme, has been extended to run through April 5.

24
Spirits Of The Rainforest
9 a.m. - 5 p.m., daily, Monsanto Hall. An exhibit of photographs and drawings of tropical rainforests, on loan from the Carnegie Museum of Natural History. Exhibit runs through February 28.

Story Of The Garden Library
1:30 p.m., Sat., Shoenberg Auditorium. Librarian Connie Wolf gives a fascinating slide show and lecture on the history and treasures of the Missouri Botanical Garden's Library. Free.

28
Gardening By Design
1 p.m. & 8 p.m., Wed., Shoenberg Auditorium. Ken Druse, contributing garden editor, *House Beautiful*: "Container Gardens." (*See Highlights.)*

31
Botany Field Days
9 a.m. - 5 p.m., daily. Get a closer look at the Garden's research program during this nine day event. (*See Highlights.)* Free. Runs through February 8.

FEBRUARY

10
Black Heritage on Film
7:30 p.m., Tues., Shoenberg Auditorium. "Stormy Weather" - A dazzling tribute to Black film entertainer Bill "Bo Jangles" Robinson, highlights several decades of American song and dance. Features Bill Robinson, Lena Horne, Cab Calloway and some of the country's leading blues artists. $1 Members, $2 non-members.

11
Gardening By Design
1 p.m. & 8 p.m., Wed., Shoenberg Auditorium. Charles Thomas, president, LilyPons Water Gardens: "Water Gardening." (*See Highlights.)*

12
Members' Organic Gardening Lecture
1 p.m. & 7:30 p.m., Thurs., Shoenberg Auditorium. Master Gardeners and special guest, Ellen Jantzen, vegetable gardening afficionado. Details coming soon in your personal invitation.

17
Black Heritage On Film
7:30 p.m., Tues., Shoenberg Auditorium. "Native Son" - Richard Wright's forceful story about blacks in the tenements of Chicago's south side. One of the towering achievements of black literature. $1 Members, $2 non-members.

18
Gardening By Design
1 p.m. & 8 p.m., Wed., Shoenberg Auditorium. Henry Mitchell, garden columnist, Washington Post: "Old Roses in Modern Gardens." (*See Highlights.*)

19
Black Heritage On Film
7:30 p.m., Thurs., Shoenberg Auditorium. "A Raisin in the Sun" - a truly magnificent motion picture, based on Lorraine Hansberry's novel, is full of sharp wit and solidly gripping drama. $1 Members, $2 non-members.

24
Black Heritage On Film
7:30 p.m., Tues., Shoenberg Auditorium. "Cry The Beloved Country" - a South African priest is drawn to the city in search of his son, only to find that he has been sentenced to death for murder. A stirring plea for interracial understanding, based on Alan Paton's best seller. $1 Members, $2 non-members.

26
Gardening By Design
1 p.m. & 8 p.m., Wed., Shoenberg Auditorium. David Smith, director of horticulture, White Flower Farm: "Perennials Through the Season." (*See Highlights.*)

Black Heritage On Film
7:30 p.m., Thurs., Shoenberg Auditorium. "Lady Sings the Blues" - Diana Ross lovingly portrays the greatest American blues singer, Billie Holliday, who was born into poverty, became a living legend, and died at age 43. $1 Members, $2 non-members.

Ornamental Shrubs
7 p.m., Thurs., Ridgway Center. Learn which shrubs are best for your garden. $7 Members, $8 non-member. Call 577-5140 for registration information.

28
Spring Gardening Fair
9 a.m. - 5 p.m., Sat. & Sun., Ridgway Center. For more information see Highlights or call 577-5125 after January 26.

Ask the Answer Service

Information, Please

One of the most useful services the Missouri Botanical Garden provides the home gardener is the expert advice given by the Horticultural Answer Service. Started in 1960, this telephone service is now staffed by 40 volunteers who take turns answering the phones from 9 a.m. to 12 noon, Monday through Saturday, March through October, and 9 a.m. to 12 noon, Monday through Friday the rest of the year. These specially trained volunteers are ready to share their knowledge to help solve your plant problems. Just call ***(314) 577-5143*** *but* ***please*** *be patient if the line is busy and try again.*

With this issue of the ***Bulletin*** *we begin a new feature by providing answers to commonly asked questions the Answer Service receives. If you have a specific question or would like more information, please call. They are more than happy to help.*

Q. I stored my garden chemicals in an unheated tool shed this winter. Though none of the containers burst, the contents may have frozen. Can I still use them in my garden this year?

A. Be hesitant to use any liquid formulations, especially your emulsifiable concentrates, as freezing can alter their makeup. Some solutions can be harmed as well. Dry formulations (powders, granules and dusts) are not likely to have been altered by cold temperatures; however, many garden chemicals have a "shelf life" and can decrease in potency with time. Mark the purchase date on any chemicals and replace liquids every year and powders every two or three years. Always store chemicals in child-proof areas that are not subject to drastic temperature changes.

Q. The tips of the older leaves of some of my houseplants turn brown and crisp. The soil drains well and I'm careful not to over or under water. What's wrong?

A. Low humidity or salt damage may be the culprits. Increase humidity around plants best with a humidifier. Grouping plants fairly close together may help. Also try trays or saucers filled with pebbles and water. Place your plants on top of the pebbles but not in water. As the water evaporates, the humidity rises.

Salts can accumulate in soils from water or from fertilizers. Leach excess salts by flushing the soil with large amounts of water (best done in a sink). Allow the water to drain completely and repeat three times. Dead stem tips can be trimmed and reshaped with scissors.

Q. I've heard about the new Dallas Fern and it sounds too good to be true. What can you tell me about it?

A. Like its cousin, the Boston Fern (*Nephrolepis exaltata* Bostoniensis), the Dallas Fern (*Nephrolepis exaltata* Dallasii) is bound to become a popular house plant. A more adaptable plant, the Dallas Fern is tolerant of a wider range of temperatures than the Boston Fern. It will also tolerate lower light and low humidity, making it well suited for the office or home. Because its fronds are shorter and not as cascading as a hanging Boston, the Dallas may be better suited as a table fern. Keep the soil evenly moist, fertilize regularly and repot when the roots begin to entangle one another.

Q. I moved to the St. Louis area recently. Can you recommend any books or publications that are helpful to local gardeners?

A. I find *The Garden Diary*, published by the Garden Club of St. Louis to be particularly helpful. *Grounds For Gardening* pamphlets are available in book form from the University of Missouri Cooperative Extension Service and are very thorough and comprehensive. The Missouri Department of Conservation publishes a fine booklet titled *Trees For Urban Missouri.*

Q. Last summer my old-fashioned Lilac bush became covered with a white filmy "dust." What was this and will it kill my lilac?

A. Sounds like your lilac had a powdery mildew fungus. This is not unusual during our humid summers. Though unsightly, the fungus rarely causes lasting damage. Control best by raking and destroying fallen, infected leaves and spray with a fungicide labeled for control of powdery mildew.

Q. Last year the weeds in my ornamental beds really got out of hand. I don't have the time to weed and hoe and since we have young children and pets I hesitate to use chemicals. Any suggestions?

A. Traditionally, a good thick layer of organic mulch could be used to hold down weed competition while allowing water and air to reach the soil. A fairly recent and exciting new product on the market now is the woven Weed Barriers. Made from a variety of materials, the best are constructed of flat ribbon polypropylene yarns. Permeable enough to allow air, water, fertilizer and insecticides through to the soil, these fabrics are durable enough to allow foot traffic and can come with a guarantee of up to ten years. Best of all you can mulch on top of them with gravel or organic materials to retain that "traditional" look.

Q. My hydrangeas didn't bloom much last year. What can I do to make them bloom better?

A. Hydrangeas grow best in a well-drained site that receives at least four hours sunlight a day. Prune them back heavily each spring and fertilize with superphosphate. As trees mature they may cast too much shade on other ornamentals. Selective pruning may allow more sunlight to shine on your hydrangea if shade is becoming a problem.

Q. The leaves of my gloxinia have a silvery, scraped appearance and the blooms are deformed. What's wrong?

A. Your plant may have greenhouse thrips. These insects are quite small and feed by rasping plant tissue and sucking the juices. Hatchlings are a translucent white color maturing to brown or black winged adults. Thrips are controlled by several insecticides. Be sure to use one labeled for gloxinias.

— Chip Tynan, Answer Service Aide

Pitzman Nature Program Celebrates 29 Years

The Pitzman Nature Program is now in its 29th year at the Missouri Botanical Garden. So far 34,358 children, ages 7-16, have profited from this program resulting from the generous annual contributions made by the Pitzman Fund.

The Pitzman Nature Program over the years has provided an opportunity for students to investigate the natural world, gaining an understanding of their realtionship to it. The program has been divided into the Nature Study Program, located at Shaw Arboretum and requiring several days of involvement by the students, and the One-Day Investigative Workshops held at the Garden.

During the summer of 1986, the Pitzman Fund also partially supported the Pitzman Nature Program taken by all 185 students, ages 7-16, that enrolled in the new Henry Shaw Academy.

Over the years many students who were enrolled in the Pitzman Nature Program have continued to be supportive of the excellent program offerings, have commented on how much they have personally gained from the programs, and subsequently have enrolled their own children in it. The program has enabled many children to learn about their environment and natural history at the Garden and by utilizing the outdoor facilities of The Adylne Freund Education Center at Shaw Arboretum.

A sudden cold snap in mid-November put these fish on ice. The bronze, "Three Sturgeon," by Sirio Tofanari is on display in the pool at the east end of the Swift Family Garden.

ENVIRONMENTAL EDUCATION PROGRAMS GET BOOST FROM GRANT

The education department has received a grant of $68,664 from The Joyce Foundation in support of environmental education programs. This is the third year that the education department has received funds from The Joyce Foundation.

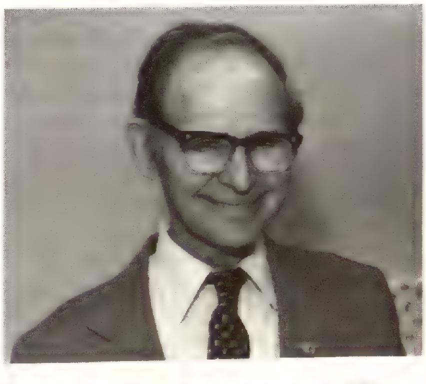
In a new phase of the Garden's award-winning Environmental Leadership Program, ECO-ACT, the Garden will improve and expand its curriculum materials and support services on the high school and elementary levels.

In the ECO-ACT program, high school students are trained to teach environmental science to elementary school students through the school year. The Garden will begin a major evaluation of the effectiveness of the ECO-ACT program as a method of instruction in environmental education.

The Garden will also conduct the fourth St. Louis Science Teachers Symposium in the fall of 1987 with nationally recognized keynote speakers and workshops that provide teachers with hands-on materials for the classroom.

In addition, the Garden will continue to conduct its series of all-day environmental science workshops for high school students and their teachers on energy conservation, tropical deforestation, and world hunger.

Finally, The Joyce Foundation funds will be utilized to continue support for Suitcase Science curriculum boxes. The boxes contain complete lessons and materials for teachers to check out and use in their classes. With continued support, the Garden will complete three additional boxes and involve teachers in evaluating and revising the materials, edit them for publication and wider dissemination, and continue teacher workshop offerings.



Art Christ Honored at 80

On November 18, friends, co-workers and admirers gathered to pay tribute to Art Christ on his 80th birthday. In his honor, they initiated a fund to develop a native wildflower area at the Arboretum. Preliminary work has begun on a two acre wooded site at the north end of Pinetum Lake, and ultimately the area will contain many native wildflowers, flowering shrubs and understory trees.

Christ has spent his life sharing knowledge with others. Following his retirement from teaching eighth grade science, he has worked steadily to kindle the spirit of appreciation in others. He has volunteered in the botany department at the Garden, worked tirelessly at the Arboretum, and supported many organizations devoted to conservation. Christ has been a member of the Webster Groves Nature Study Society since 1930. He is also a member of the Missouri Prairie Foundation, the Nature Conservancy and the Friends of Tyson. Christ has also discovered many plants new to Missouri.

Dr. Raven acknowledged Christ's 14 years of volunteer service at the Garden, and called him a "magical individual" who has inspired people to appreciate the natural beauty of the environment. Raven said, "He has made hundreds and thousands of advocates and converts to the Missouri natural scene." Christ was honored by tributes from the Missouri Department of Natural Resources, Conservation Department, students and friends who have benefited from his knowledge over the years.

During his birthday luncheon, Christ delighted his admirers with stories of the Shaw neighborhood when he was a child near the turn of the century. He even confessed to crawling through a sewer pipe with his friends to gain entry to the Garden.

FROM THE MEMBERSHIP OFFICE

A Howling Success!

Over 900 ghosts, goblins, and Halloween critters celebrated the spooky event at Henry Shaw's Halloween Garden. Witches, spiders, clowns and mimes greeted all the young visitors to the Garden that evening. There was storytelling and a costume contest, monster munchies, a magic show, and trick-or-treat bags for everyone. Despite the cold weather, a long line for the costume contest and some last minute changes, a great time was had by all!

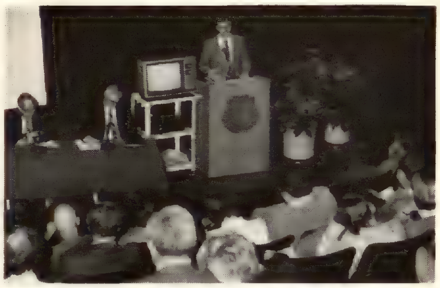
Special thanks to the Halloween party's chairmen: Mico Murphy, David Wells, Carolyn Bloom, and Nora Stern, as well as their trusty helpers, Mim Kittner, Marian Gould, Margot Thiebauth, Anne Bowen and Andrea Schankman. Thanks also to KMOX Radio, Schnucks Markets, Acme Premium Supply, TKO DJs and the Haberdashery Vintage Clothing for making Halloween a hauntingly fun night at Henry Shaw's Garden!

1987 Members' Days

January 18	Climatron Tour by Garden Guides
February 12	Vegetable Gardening Lecture and Hints
March 6	Tree Conservation Lecture
April 11	Arbor Day Celebration for Children and Dads
May 28	Purple Martin Evening
June 14	Lehmann Building Tour
July 11	Members' Musical Night at the Garden
August 1	Early Morning Stroll
September 19	Dawn Photo Session at the Arboretum
October 7	Members' Cider Stroll
November 18	Senior Day at the Garden
December 5	Holiday Decorating Demonstration

Botanica

Botanica, the Wichita, Kansas, Garden, is the newest botanical garden to be added to the list of reciprocal horticultural institutions open to Missouri Botanical Garden Members. In addition to Botanica, Garden Members can visit the following institutions in their travels: Blithewold Gardens and Arboretum, Chicago Botanic Garden, Dallas Arboretum and Botanical Society, Hershey Gardens, Massachusetts Horticultural Society, Morris Arboretum, and New York Botanical Garden.



Missouri Wine Experience

Vintners, Jon Hill of Stone Hill Winery, Lucien Dressel of Mount Pleasant Winery, and Larry Carver of Carver Wine Cellars, enlightened a group of Garden members on the intricacies of the wine-making industry in October. Bob Kabel, sommelier, organized the program.

I ♡ my Valentine, the Garden and Fannie May Candy

On Valentine's Day make an impression with your special someone by sending them a membership to the Missouri Botanical Garden, a box of Fannie May Candy, and a message straight from your heart. You can do all this by calling the membership department at 577-5118 and ordering your Valentine's package by phone or by completing the application below. The membership department will deliver your Valentine's message, the candy and your Valentine's new membership cards on Valentine's Day. What a way to make an impression with the ones you love!

GIFT MEMBERSHIP ORDER FORM — *Please mail at least three weeks prior to occasion:*

☐ *Birthday* ☐ *Valentine's Day* ☐ *Other* ______________________

Gift To:

NAME ______________________

ADDRESS ______________________

CITY ____________ STATE ______ ZIP ________

TELEPHONE ______________________

Sign gift card: ______________________

Date Needed By: ______________________

Regular Membership $35. Contributing Membership $75.

For more information call 577-5118.

Gift From:

NAME ______________________

ADDRESS ______________________

CITY ____________ STATE ______ ZIP ________

TELEPHONE ______________________

☐ Enclosed is my check for $ ______________

☐ Please charge: VISA No. ______________

MasterCard No. ______________

Name as it appears on card: ______________

Expiration date: ______________

Please make checks payable to: Membership Office, Missouri Botanical Garden, P.O. Box 299, St. Louis, MO 63166.

Trustee Profile

Robert R. Hermann

At the November 26 meeting of the Board of Trustees, Board President John H. Biggs presented Trustee Robert R. Hermann with a sterling silver plate honoring him for 20 years of service on the Missouri Botanical Garden's Board of Trustees.

Hermann was first elected to the Board of Trustees in 1966 and served as first vice-president in 1977. In 1979, he was chairman of the capital fund drive committee and presently serves on the Garden's fund raising steering committee.

Asked what changes he has noticed in the Garden over the past two decades he said, "We have implemented a master plan for the Garden which has vastly improved the physical assets of the Garden. It has also given us a better sense of direction for our programs. This has led to the Garden gaining a truly world-class reputation as a leader in tropical botany research, display and education."

"Through Peter Raven's leadership this reputation has grown to not only benefit the Garden but the St. Louis area as well. The Garden now brings visitors to St. Louis from all over the world," he said. "We had over 600,000 visitors to the Garden in 1986, our best year ever, and this has benefited the entire community."

In addition to serving on the Board of Trustees, Hermann is a member of the board of directors of the Arts and Education Council, Barnes Hospital, Dance St. Louis, Municipal Theatre Association, and the VP Fair Foundation. He is the chairman and chief executive officer of the Hermann Companies, Inc.

Plant Talk From the Gardenview Restaurant

Vanilla

FOOD FACTS:

Vanilla was first discovered by Cortez and his Spanish explorers around 1520 in Mexico. The Aztecs called it *Tilxochitl* meaning "little pod" and had been using it for hundreds of years to flavor their chocolate drinks. The use of vanilla in chocolate products increased with the Spaniards and seem to spread in popularity wherever their conquests took them.

Vanilla is derived from a pod (bean) which is the fruit of the vanilla orchid. The vanilla orchid is a viney member of the family Orchidaceae and although there are 90 vanilla species, the popular vanilla with its sweet aromatic scent is the species *Vanilla planifolia.* This exotic climbing orchid has pale yellow flowers with large, fleshy, oblong leaves. The plant as it matures climbs and twines around adjacent tropical trees for support. The delicate orchid after pollination grows a green pod about ten inches long that contains a mass of tiny seeds.

Although native to Mexico, the vanilla orchid now grows in moist tropical areas around the world. Its cultivation was spread by cuttings but often these plants yielded no fruit. The absence of fruits was found to be a result of the lack of pollinating insects native only to Mexico. In 1836, a hand pollinating method was discovered which is still used today. Today's commercial vanilla crop is kept pruned to allow for hand pollination, and each field worker can hand pollinate up to 2,000 flowers each day. Vanilla plantations growing the bulk of the world's crop are located in Java, Brazil, the West Indies, the Seychelles and the Malagasy Republic.

During the early stages of World War II, vanilla was difficult to obtain because the major plantations were located in Pacific regions controlled by the Japanese. Although synthetic vanilla had been invented in the early 19th century, its popularity in the absence of the true vanilla extract in the early 1940s led to newer techniques of preparing synthetic vanilla. Synthetic vanilla was obtained by distilling clove oil or processing cane sugar, waste paper pulp and coal tar — but none had the true essence of pure vanilla.

FOOD TIPS:

Vanilla Refrigerator Cookies

1/2 cup butter, softened
1 cup sugar
1 beaten egg
1 teaspoon vanilla
1 3/4 cups flour
1/4 teaspoon salt
1 1/2 teaspoon baking powder
1/2 cup chopped nuts

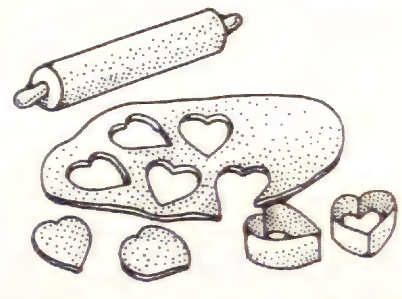
Cream butter and sugar together until light and fluffy. Mix in beaten egg. Add vanilla. Sift flour, salt, and baking powder together. Stir sifted ingredients into butter mixture. Add chopped nuts. Form a 2" roll of dough, wrap in foil and chill at least 12 hours. Slice very thinly, sprinkle with sugar and bake at 400° for 8 to 10 minutes.

Kids' Tip:

A vanilla crop is harvested after three years and will fruit for 12 years. The vanilla extract bought in bottles is a result of alternate drying and fermenting the pods for five to six months, after which the pods turn a soft dark brown and accumulate vanilla crystals which are extracted and dissolved in alcohol. Vanilla extract has a delicate, spicy, aromatic flavor that is unique and used as a flavoring for chocolate, puddings, cakes, cookies and other sweet dishes. It is also a popular flavoring agent in ice cream, soft drinks, liqueurs, tobaccos and perfumes.

Vanilla can be bought in bottles or pods, and the pods can be stored in a jar of sugar to impart their flavor, and the sugar then used as a sweetening agent.

— Kenneth D. Laser
Chairman, Education Department



For Younger Members

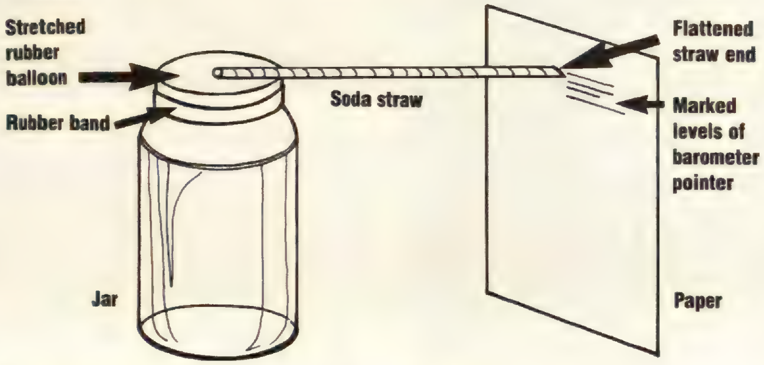
The Ground Hog — Nature's Alarm Clock?

"How much wood could a woodchuck chuck if a woodchuck could chuck wood?" This nonsense rhyme speaks of an animal also commonly known as the **ground hog**. The ground hog, or woodchuck, is a member of the squirrel family. Contrary to the rhyme, the ground hog does not "chuck wood." Its diet consists of plants, such as clover or alfalfa.

Unlike the squirrel, which often builds its nest in the top of a tree, the ground hog lives under the ground in a tunnel or **burrow**. The burrow contains many compartments. During the fall season, the ground hog eats large amounts of food which is stored as fat in its body. In winter, the ground hog **hibernates** or sleeps underground in its burrow. It uses the stored body fat to live on during its winter sleep.

February 2 is Ground Hog Day. On this day the ground hog takes center stage as a predictor of the spring season. There is a superstition that the ground hog will let us know that spring is very near or still six weeks away from February 2. On Ground Hog Day, people watch for the ground hog to come out of its burrow. According to the superstition, if the sun is shining, the ground hog will see its shadow. This is supposed to mean that spring is six weeks away. But if the sun is *not* shining on February 2, and the ground hog cannot see its shadow, then spring will come early. Do you think this is a good way to predict weather? How many other ways can you think of to tell when spring is coming?

—Ilene Follman
Education Consultant



A Barometer Helps Predict Weather

One way to predict changes in the weather is to use a **barometer**. A simple barometer measures changes in air pressure. These changes cause the barometer to rise or to fall. A falling barometer indicates that a storm is near. A rising barometer often means that better weather is ahead. The barometer cannot predict the weather six weeks ahead, but it can indicate weather changes in the days ahead. You can make a simple barometer by following the directions below.

You will need: jar or can with a 1½-2 inch opening; deflated balloon; rubber band; soda straw; paper; scissors; pencil; tape; nail polish or glue.

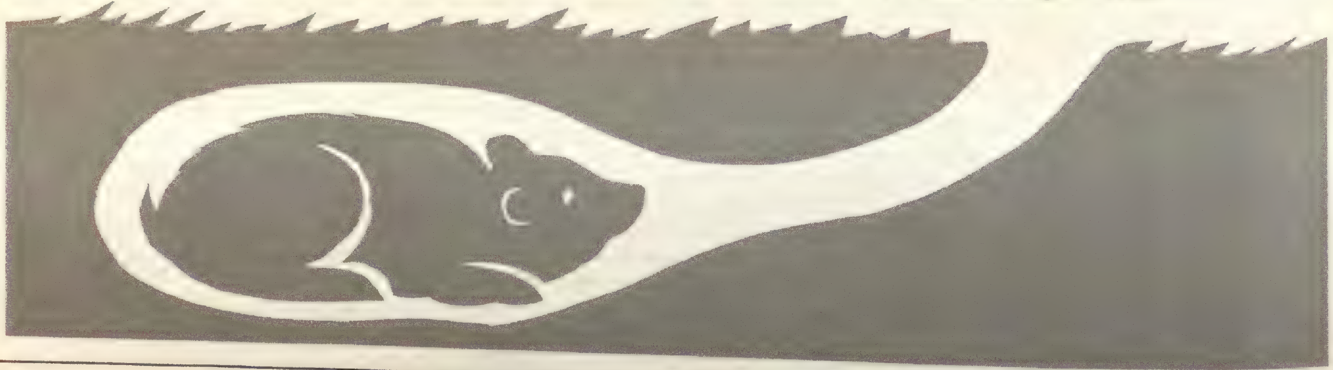
What to do: Use the scissors to cut a large section of rubber out of the balloon. Stretch the piece of balloon over the opening in the jar or can. Fasten the stretched balloon with a rubber band. Flatten one end of the soda straw. Using a few drops of glue or nail polish, fasten the other end of the straw to the center of the stretched balloon. Be sure the straw rests against the rim of the jar. The flattened end will serve as the barometer's pointer or "needle."

Attach a piece of paper to the wall with tape. Place the barometer on a table near the wall so that the pointer nearly touches the paper. On the paper, mark the position indicated by the barometer pointer. Watch the pointer for a period of days. Does it change position? Mark the new position on the paper. What weather changes have occurred outdoors? Were you able to predict those changes?

Predicting the End of Winter

Ground hogs and barometers are not the only predictors of changes in weather or seasons. By carefully observing changes in plants and animal behavior, you too can tell when winter is nearing its end. Here is a short checklist for you to use during the month of February. See how many of nature's clues you can observe.

- days lengthen
- birds and bird sounds are more obvious
- tree buds begin to swell
- insects become more obvious
- tree sap begins to run



Mrs. Zimmerman and Alan Godlewski

Sculpture Added to Scented Garden

A wind chime sculpture consisting of several bells designed by artist Paulo Soleri has been added to the Scented Garden for the Blind. The Scented Garden and bell sculpture were made possible by gifts from Mrs. E. F. Zimmerman. The Scented Garden was given in memory of her grandmother, Susannah F. Mack, and her mother, Lillian C. Lowis.

The tree-form structure supporting the bronze bells was a collaborative effort by William C. Severson, sculptor at Scopia Co. in Chesterfield, and by Vernon Desmond Gross, St. Louis sculptor.

The Scented Garden was completed in 1983 and is designed especially for the visually impaired. Plants with strong fragrances and interesting textures are in abundance. Braille identification tags are provided. A shell fountain appeals to one's sense of hearing.

"Mrs. Zimmerman's continued generosity through the addition of the bell sculpture helps the Scented Garden have a stronger appeal to the sense of hearing, and will be a delight to all Garden visitors," said Alan Godlewski, director of horticulture at the Garden.

Botanical Garden Subdistrict Adds Commissioner

John H. Poelker, former Mayor of the City of St. Louis, has been chosen as a Commissioner of the Botanical Garden Subdistrict with the approval of Vincent C. Schoemehl, Jr., Mayor of the City of St. Louis. The Botanical Garden Subdistrict is part of the Metropolitan Zoological Park and Museum District of the City of St. Louis and the County of St. Louis.

GARDENING BY DESIGN

LECTURE SERIES

Learn how to garden in the shade, on your rooftop, or in the water. All of these topics will be covered in the Wednesday lecture series **Gardening By Design**, during January and February.

The series begins on **January 14,** with a special "how-to" for homeowners. John Alex Floyd Jr., the editorial director for *Southern Accents* magazine, will lecture on "Making Your Home Landscape Fit."

January 21, Doug Gilberg, owner of Gilberg Perennial Farms of Glencoe, Missouri, will talk about "Shade Gardening With Perennials." He will emphasize plants that grow particularly well in this area.

January 28, Ken Druse will focus on "Container Gardens." Druse is a contributing editor to *House Beautiful* magazine, and recently his container garden was featured on television's PM Magazine.

February 11, the lecture will focus on "Water Gardening." Charles Thomas, president of Lilypons Water Gardens, will show how to create a water garden on your condominium balcony or your estate.

February 8, will feature everyone's favorite — roses. Henry Mitchell, garden columnist for the Washington Post, will share tips on "Old Roses in Modern Gardens."

February 25, David Smith will show you how to maximize "Perennials Through The Seasons." He will feature cultivation, propagation and design in seeking color from early spring through fall. Smith is director of horticulture for White Flower Farms.

Watch your mail for an opportunity to subscribe. Tickets will be sold by subscription through the mail, with all six lectures priced at $20 for Garden Members and $25 for non-members.

Each lecture will be given at 1 p.m. and again at 8 p.m. Subscriptions may be purchased for the afternoon series or the evening series only. Tickets cannot be mixed in one subscription.

Single tickets will only be available if the series is not sold out, and then only at the door the day of the lecture. For more information, call 577-5125.

Raven Travels to Japan to Accept International Prize for Biology

The International Prize for Biology was presented to Garden Director Peter H. Raven in ceremonies, November 20, in Tokyo, Japan. He received the award, which consisted of a silver vase from the Emperor of Japan, a medal made from a special alloy of gold, silver and copper, and a cash prize, for his contributions to the study of systematic biology.

Pictured above at the Japan Academy is Professor Yuichi Yamamura, standing right, chairman of the Science Council of the Ministry of Education, Science and Culture, presenting the award to Dr. Raven, left. Seated to the right is Crown Prince Akihito and Princess Michiko. Mrs. Raven is at far left.

Following the awards ceremony, Dr. and Mrs. Raven traveled to the Imperial Palace where they had an audience with 85 year old Emperor Hirohito who quizzed Dr. Raven extensively on the biology of the Onagraceae or evening primrose family, his specialty.

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SEPTEMBER-OCTOBER 1986

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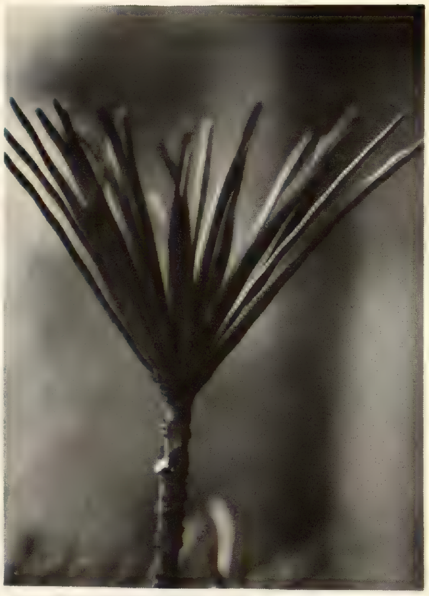
Plants To Remember

Umbrella Pine



Not a true pine (that is, not a species of the genus *Pinus* in the family Pinaceae), umbrella pine (*Sciadopitys verticillata*) is a member of the family Taxodiaceae along with bald cypress (*Taxodium distichum*), dawn redwood (*Metasequoia glyptostroboides*), and giant sequoia (*Sequoiadendron giganteum*). Like the last two species in the preceding list, umbrella pine belongs to a genus of just one species confined presently in the wild to a small area. *Sciadopitys veticillata* grows natively only in central Japan; more widespread, fossils identified as *Sciadopitys* have turned up in Greenland and in Europe.

The common name umbrella pine comes from the attractive whorls of long thick needles arranged a little like ribs of an umbrella.

The species has diverse roles in human affairs. Its wood is renowned for resistance to decay. As an example, the pilings of a bridge in Japan made from *Sciadopitys* lasted 300 years — unpainted. The wood is also used in the construction of boats and the bark serves as caulking. Living umbrella pines withstand fire, with the practical result that they have been planted protectively around buildings. In parts of Japan umbrella pine is known as "all souls pine," and on All Souls Day sprigs from it are placed decoratively on ancestral altars.

Its eye-catching novelty, symmetrical pattern of growth, deep green color, and undemanding maintenance requirements are enticements to cultivate *Sciadopitys* at home. However, nothing is perfect — it requires acid conditions, sometimes loses branches in ice storms, and grows slowly. Before digging a hole in your yard, come visit the Garden and find a trio of young umbrella pines across the walkway from the Mediterranean House.

— George Rogers

MISSOURI BOTANICAL GARDEN BULLETIN (ISSN-0026-6507)
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Missouri Botanical Garden

BULLETIN

Volume LXXV, Number 2

March-April 1987

Building A Better Garden

Inside This Issue

3 New and Improved
Construction crews will be at work improving the Garden's facilities this spring.

4 Report from Tanzania
Botanist Jon Lovett is conducting the Garden's research efforts in this diverse African nation.

7 Gardening at the Garden
African Violets, native to Tanzania, make fascinating houseplants.

8 Ask the Answer Service
The Horticultural Answer Service is available to help solve your plant problems.

9 News from the Arboretum
The Earthkeeper program teaches youngsters about the interrelationships of living things.

10 Calendar of Events
Springtime at the Garden is full of activities for young and old.

14 From the Membership Office
Membership levels have reached an all-time high.

16 For Younger Members
March comes in like a lion and goes out like a lamb.

17 Tributes
Friends and family honored with a contribution to the Garden.

On the Cover: Workers from Martin Landscaping of Hudson, Illinois, installing sheet pilings along the banks of the lake in the Japanese Garden to prevent erosion of the shore. To avoid damaging the landscaping they put their crane on a raft in the lake. Photo by L.T. Spence/St. Louis Post-Dispatch.

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The BULLETIN is sent to every Member of the Garden as one of the benefits of membership. For a contribution of as little as $35 per year, Members also are entitled to: free admission to the Garden, Shaw Arboretum, and Tower Grove House; invitations to special events and receptions; announcements of all lectures and classes; discounts in the Garden Gate Shop and for course fees; and the opportunity to travel, domestic and abroad, with other Members. For information, please call (314) 577-5100.

Postmaster: send address changes to Lee B. Fox, editor, BULLETIN, P.O. Box 299, St. Louis, MO 63166.

Comment

MISSOURI BOTANICAL
MAR 11 1987
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Springtime at the Garden

The Garden is an exciting and interesting place to visit any time of the year but one of my favorite times is in the spring. After being cooped up inside most of the winter and being enticed by all the wonderful seed catalogs which arrive in January, it is truly delightful to walk through the Garden on a warm spring day and see crocus blooming near the Lehmann Building or the snowdrops in the mausoleum area and English Woodland Garden. The tulips, daffodils and other spring bulbs in bloom by the thousands in the Samuels Bulb Garden, in front of the Ridgway Center and Linnean House and around the Lily Pools make one glad to be alive.

Even on those cool, wet days of spring the Garden is a magic place. A walk through the Climatron, Desert House or Mediterranean House transports you instantly to far away and exotic places. A walk through the Orthwein Floral Hall to take another look at the exquisite Orchid Show is a perfect prelude to lunch in the Gardenview Restaurant. For a trip back in time, a visit to Tower Grove House is a must.

There are more than enough activities and events going on at the Garden to satisfy most anyone. The education department has dozens of classes, both at the Garden and at Shaw Arboretum, for young and old on a variety of topics related to gardening and nature study.

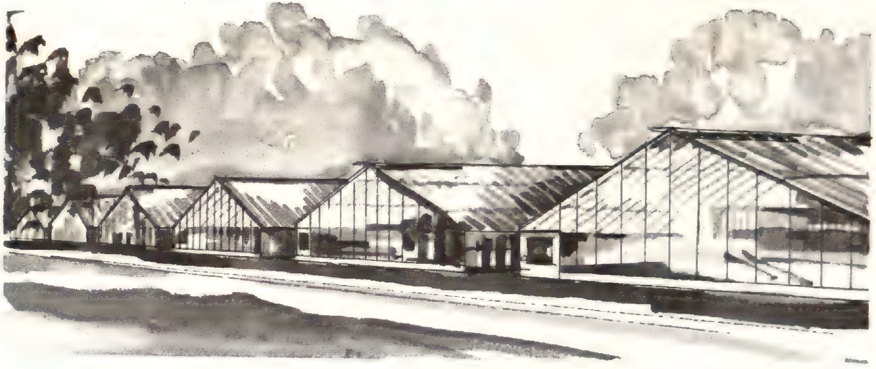
New exhibits in Monsanto Hall, concurrent with the Orchid Show, include a look at the Garden through the eyes of the students at Washington University's Create Studio in March and a spectacular display of close-up photographs of the Japanese tree peony by noted photographer and gardener Sir Peter Smithers in April.

Other activities this spring include the Spring Lecture Series, Arbor Day celebration, Spring Plant Sale, African Violet Show, and the Members' auction and sale of rare plants and services from the Garden.

Please come visit your Missouri Botanical Garden this spring and all year long.

Peter H. Raven

ALL SMILES. **The new Veiled Prophet Queen of Love and Beauty and her Special Maids visited Tower Grove House in their first public appearance in December. Pictured, left to right, are Susan Wightman Kobusch, Queen of Love and Beauty Stephanie Ann Schnuck, Mary Brookings Wallace, Katherine Pringle Ford, Hillary Rhoades Armstrong, Mary Catlin Hermann and Elisabeth Jane Terry.**



NEW AND IMPROVED

Construction and repair activities at the Garden hold the promise for a bright future.

Spring is just about here and, like most of us, it is time for cleaning up and fixing up. Most homeowners will be emptying out their basements, planting their gardens, and fixing up damaged or worn roofs, gutters and buildings. The Missouri Botanical Garden is about to do the same thing except that our "home" consists of over a dozen buildings on 79 acres.

The Garden's "spring-cleaning" has already begun and will continue, in various phases, for the next year or so. Construction and renovation projects planned for the near future include replacing the "production" greenhouses west of the Azalea-Rhododendron Garden, improvements to the lily pools and walkways in front of the Climatron, and installing sheet pilings to prevent erosion of the banks of the Japanese Garden lake. In addition, Garden staff will soon be planting the new Jenkins Daylily Garden, Kaiser Memorial Maze, a bigger and better wildflower garden, and hundreds of colorful annuals. While some phases of these projects will cause temporary disruption of traditional programs and traffic patterns, the overall result will be a more beautiful Garden for your enjoyment.

Production Greenhouses

These greenhouses are used by the horticulture staff to propagate and prepare plants "behind-the-scenes" for placement on the grounds or in the flower shows and conservatories. Some of the greenhouses are also used by the research staff to grow live specimens collected in the tropics for study. The greenhouses are old, inefficient, and in poor physical condition.

A new glass and aluminum house will be built on the foundation of the old floral display hall starting about early April. Once this house is complete, the other houses will be torn down and the site excavated for a 10,000 square foot basement which will house new mechanical equipment including a water treatment center to temper the water used on the plants. More new glass houses will be built over this basement.

Total project costs, including engineering, equipment, fees and construction are estimated at $2.8 million and should take about a year to complete. While the greenhouses are being rebuilt, the Orthwein Floral Hall will be used to store some of the plants displaced by the construction. Seasonal flower displays will be seen in other spaces until the project is finished.

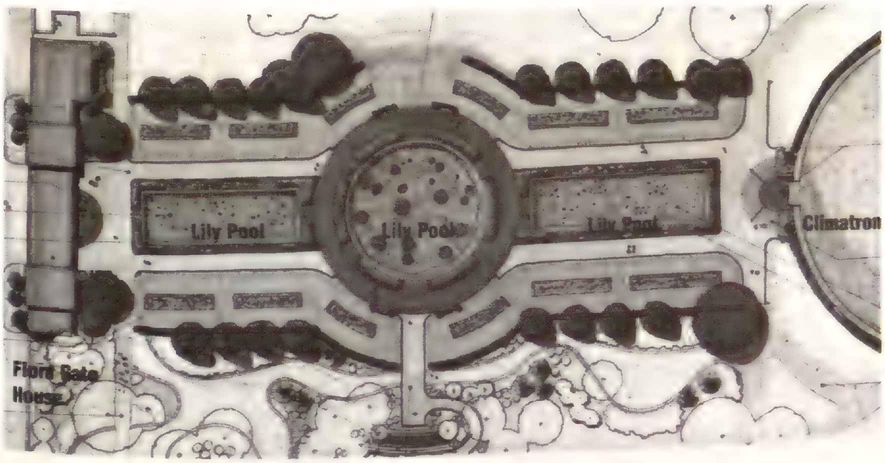
Climatron Axis and Lily Pools

Recently an anonymous donor made a very generous contribution to the Garden for improvements along the axis between the Climatron and Flora Gate. Construction, which will begin in late spring and should be completed in time for the Japanese Festival, includes repaving the walks in brick and exposed aggregate concrete, installing new sewer, water and electrical lines to the lily pools, and recoping the edges of the pools in limestone and granite. Also, spectacular new lighting will be installed around the pools and nearby trees. Eventually, several new pieces of sculpture will be placed in the area.

Japanese Garden

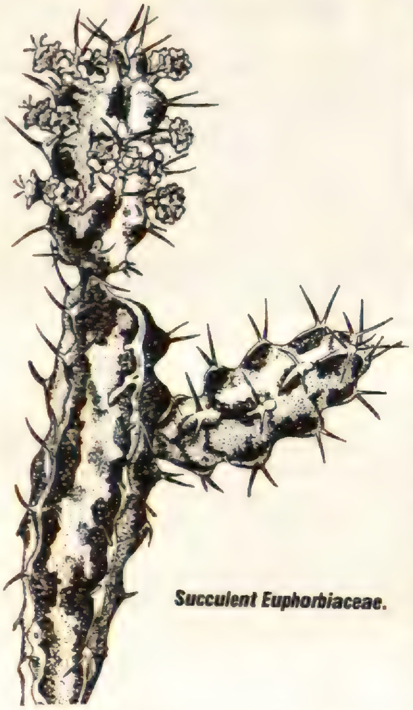
Perhaps you've seen the bright orange crane on the raft in the middle of the lake in the Japanese Garden this winter and wondered what they were doing. Workers are driving sections of corrugated sheet steel into the ground along the bank in several places around the lake to halt and prevent erosion of the shore. They are using the same techniques used on dam and bridge projects only on a much smaller scale. The steel plates, known as sheet pilings, will eventually be hidden by rangui posts and vegetation. When completed around mid-May, the lake will return to its beautiful and pristine form and stay that way for a long time to come.

This year there are so many events, displays and new gardens to enjoy, you may barely notice the construction projects. When you do notice, it will be with a sense of anticipation of what is to come. Like the spring cleaning project, the rewards are worth the wait.



Report From Africa *by Jon Lovett / Illustrations by Jill Lovett*

A Plethora of Plants



Succulent Euphorbiaceae.

TANZANIA is botanically extraordinary. In eastern Africa just south of the Equator it boasts five major plant distribution zones within the 362,820 square miles encompassed by its borders. The range and beauty of the vegetation is quite astonishing. Starting at the top — and by that I mean the very top of Kilimanjaro, Africa's highest mountain — just below the ice and snow are rocks patterned by yellow and white lichens with patches of *Helichrysum*, "the everlasting flower." There's not much else as 17,000 feet above sea level is a pretty inhospitable climate for anything, including the thousands of people who gasp their way to the top every year through the thin, cold air.

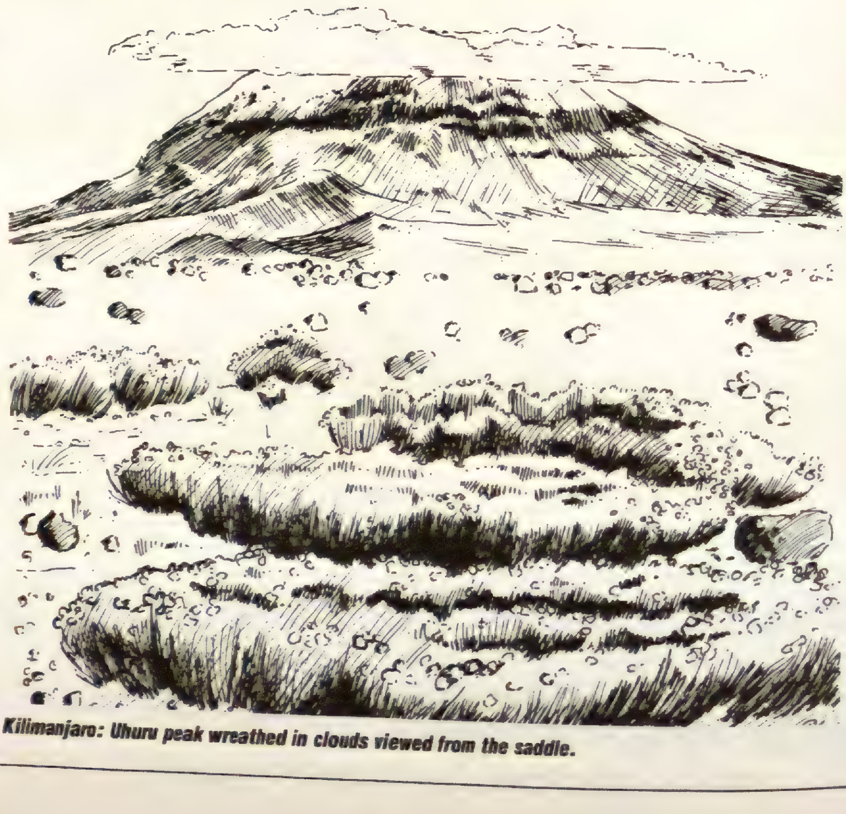
Down slope a bit and we are in the rarified atmosphere of the afro-alpine zone with weird stubby fat shrubs, the pachycaul senecios poking out of tussock grassland. Descending to where breathing is a bit easier at 12,000 feet and we are surrounded by small trees in an open bushland. But these are no ordinary small trees, they are tree heathers. Festooned with "old man's beard" is the lichen *Usnea*, and like old men, twisted and gnarled with age — though nobody knows quite how old the heathers are.

Following down the track we disappear into the depths of a dark forest with trees cloaked in mosses, ferns, epiphytic orchids and bright red and yellow flowering *Impatiens*. But before going deep into the forests of Tanzania, let's stay in the high altitude grasslands for a while longer. For that we have to leave Kilimanjaro and fly over 500 miles south to the Kitulo Plateau.

Unlike Kilimanjaro, where you have to foot slog it to the top, it is possible to drive onto the Kitulo. But beware those of you used to driving in the tropics. At 8,000 feet in the cold season it freezes at night. You have to get out of bed every few hours to start the car and keep the engine warm because nobody bothers putting antifreeze in your radiator when you live just south of the Equator. Not that waking up at night will be a problem for the beach lovers, as they won't get much sleep anyway on account of its being *so cold*. But it's all worth it when morning breaks over the rugged rocky hills and you can see the plants.

Orchids, gentians, lilies, irises, and lobelias produce a profusion of color. Just sit in one spot and count the number of species you can reach without moving, then try a different place and be astounded by the fact that you are surrounded by a whole new plethora of plants. Don't forget the suntan lotion. A few hours in that high altitude sun and you can end up pinker than the *Dierama penduliflora* nodding in the breeze at your feet. So let's get out of the sun and back into the forests.

In Tanzania there is a pretty good selection of forests from which to choose. By Lake Victoria or along the banks of Lake Tanganyika (the second deepest lake in the world) the Guineo-congolian forests that cover west Africa creep over the border in this their most easterly extension. They haven't always been there, as around 11,000 years ago in the last world glaciation Lake Victoria was as dry as a bone, so no rain, no forest. Consequently, the forests around Lake Victoria are composed of widespread species that spread into the area in the last 10,000 years



Kilimanjaro: Uhuru peak wreathed in clouds viewed from the saddle.

and do not make the forests especially interesting botanically.

The same cannot be said of the forests on the ancient crystalline mountains in the east of the country. Kept alive by warm moist air coming from the Indian Ocean even during the driest of dry times these forests are old, and were probably separated from the west African forest block about 20 million years ago. That's a very long time ago and, as a result, evolution by isolation has meant that there are more native species there than you can shake a stick at. About 25 to 30 percent of the eastern forest species are found nowhere else in the world. This means that with a total eastern forest species count of around 2,000 there are more native species than there are species in the Galápagos Islands.

That's an awful lot of interesting plants and more are being discovered all the time. In fact, back in St. Louis, you are almost certainly familiar with at least one of the eastern forest natives. If you don't know it then rush out and buy one from the Garden Gate Shop now because it is none other than the African Violet, *Saintpaulia,* whose whole genus of around 20 species is native to the forests of eastern Tanzania and southeast Kenya.

But let's leave the dark interior of the forests with their rainfall of 2,000–3,000 mm (78–117 inches) a year and pop 'round to the dry side of the mountains and into the vegetation that separates the wet eastern forests from those in the west. Just as you might expect with masses of native plants on the wet side, the rain shadow is also very old and it too has lots of unique plants. For example, behind the Uzungwa mountains in the Ruaha valley is a fantastic floristic assemblage dominated by big bulbous Baobabs and cactus-like Euphorbiaceae.

Africa is pretty short on indigenous cacti, there are only three, which is not a lot considering that there are over 2,000 in the Americas. The one we get in Tanzania, the widespread *Rhipsalis baccifera,* doesn't look like a cactus at all as it hangs from trees in the forest like a mistletoe. I have even disgraced myself in the field with one of the world authorities on mistletoes by running up with one of these things shouting "I found a new mistletoe," only to be met with the response "actually it is a cactus." You can't be made to feel much smaller than that.

continued on next page

A BRIEF HISTORY OF TANZANIA

Tanzania is more than the meeting place of tropical Africa vegetation types, it is also a meeting place of peoples. It is the only country in Africa where the four main African language groups were spoken. The original inhabitants were Khoisan or "click" speakers and are now represented by the Sandawe, a small tribe of hunter-gathers. The Chushitic herdsmen and cultivators arrived from the north many centuries before Christ and were followed by repeated waves of Chari-Nile pastoralists, the most famous members of which are the Masai. The fourth group is the Bantu, who arrived from the west about 2,500 years ago, and who were settled and smelting iron near Lake Victoria by 500 B.C. Arabic influence on the coast dates from the eighth century A.D. and arose out of trading connections. Apart from a brief period of Portugese presence following Vasco da Gama's visit to East Africa at the end of the fifteenth century the Arabs dominated the coast until the abolition of the slave trade in Zanzibar and Pemba towards the end of the nineteenth century.

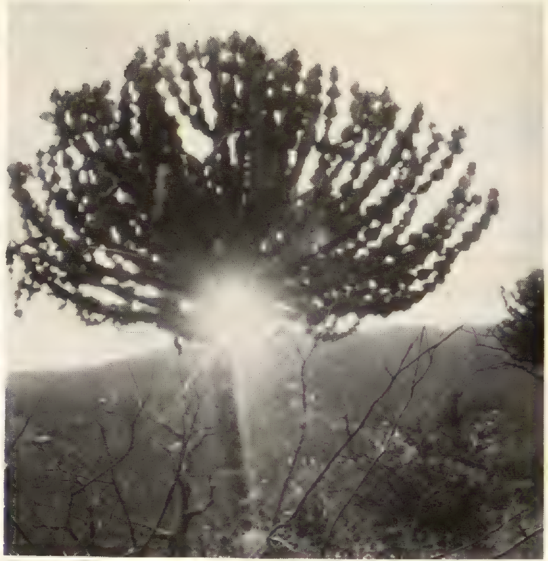
European presence in East Africa had been becoming increasingly frequent from the middle of the nineteenth century. In 1848 Johannes Rebmann reported snow on Kilimanjaro, to be greeted by ridicule in Europe as it was thought snow on a tropical mountain was impossible. Ten years later Burton and Speke stood by the shores of the great lakes, and in 1871 Stanley found Livingstone at Ujiji.

However, the age of exploration was soon followed by colonization and exploitation. In 1884, Carl Peters and his Society for German Colonization started collecting paper treaties from the headmen of villages inland from Bagamoyo. This process of bringing the country under German control was continued with increasing bloodshed by the German East African Company until 1891 when the vast area from the coast to the great lakes came officially under the administration of the imperial German government. This committed Germany to full scale colonial rule, which continued until their defeat in the First World War. East Africa was not spared the fighting of this huge international conflict, and a brilliant campaign was conducted there by Paul von Lettow-Vorbeck, who actually remained undefeated in 1918 when the war finished in Europe.

By now the European attitude towards colonization and imperialism was changing with the rise of socialism displacing the dominance of financial power, replacing it with liberal policies. So, when the British took over the administrative reins of Tanganyika it was as a trust territory under a League of Nations mandate to govern it in the interests of the native inhabitants. This they attempted to do until 1961 when there was a peaceful exchange of offices and mainland Tanganyika gained its independence. Three years later, a short and bloody revolt in Zanzibar followed a few months after the island's independence at the end of 1963, and the two were fused to form the United Republic of Tanzania in April, 1964.

Since then the country has been politically stable, internally peaceful, and free from the tribal conflicts that have troubled many other African states — largely as a result of the artificial boundaries drawn on the map of Africa by the European powers at the end of the nineteenth century. However, the republic has its problems. Economic decline brought on by increasing oil prices, a costly war with Amin in Uganda, and world recession have resulted in a massive foreign exchange shortage. This year has seen a large devaluation of the Tanzanian shilling and a change in approach to economic problems, so hopefully the country will get back on its feet again soon.

Jill Lovett collecting plants on the Kitulo plateau.



Succulent* Euphorbia *in the arid Ruaha valley.

continued

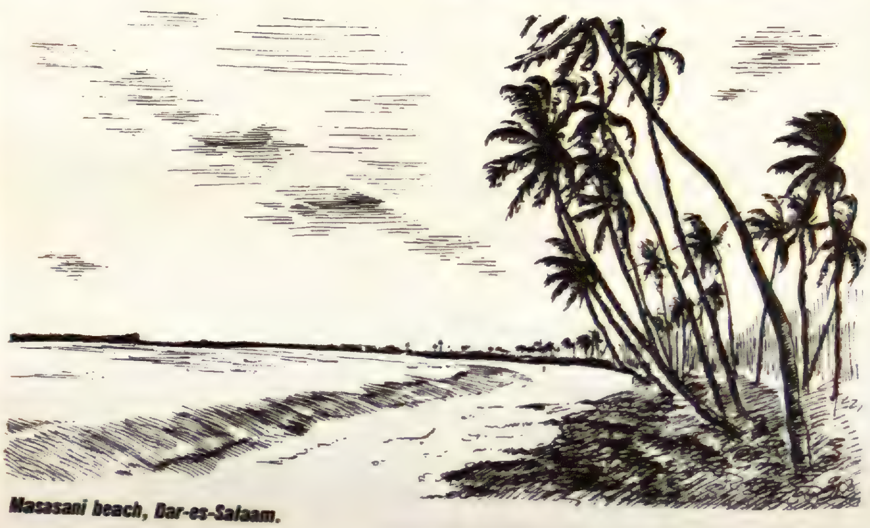
However, there are plenty of real cactus look-alikes in the Euphorbiaceae, big spikey plants with arms growing in arid areas. You don't get many cacti with a milky latex and a superior trilocular ovary, it's just that the best way of surviving in that sort of country with less than 600 mm (23 inches) of rain a year is to lose all your leaves and make like a cactus. But these are not any run of the mill succulent *Euphorbia*, there are five native species here growing cheek by jowl with a native genus in the Flacourtiaceae, some woody legumes and a couple of *Commiphora*. This all adds up to a rather interesting locality.

Put the rainfall up a bit but keep a good long dry season and Miombo grows. This is named after the local word for the *Brachystegia* tree, which dominates this type of woodland, but, before independence, was also known to the British as "Mamba country." Mamba can mean one of several things. In Swahili it is crocodile and to a herpetologist it is the name of a particularly nasty snake. To the foot slogging British administrative officers it meant Miles and Miles of Bloody Africa. Stand in Tanzania, look west and think that this stuff peters out somewhere near the coast of Angola and you get a pretty good idea of what they meant.

Still enough of that and down to the coast for a bit of relaxation, taking care to avoid the evil smelling tangle of mangroves and river deltas. Blue tropical seas lapping at silver coral sand, sun, coconut palms waving in a gentle breeze, and strand vegetation — anyone back there in St. Louis interested in funding a project on strand vegetation? ■

Jon Lovett posing in a forest.

Lobelia *flowering on the Kitulo plateau.*



Masasani beach, Dar-es-Salaam.

Gardening at the Garden

African Violets

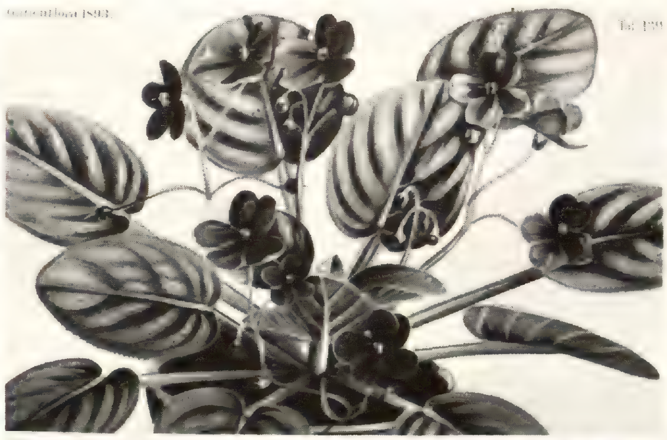

Gartenflora 1893.

Illustration of *Saintpaulia ionantha* from its original description. (From *Gartenflora*, 1893.)

Thriving on the Windowsill but Endangered in the Wild

Not related to true violets, African violets are members of the Gesneriad Family (Gesneriaceae) among such esteemed cultivated company as gloxinias (*Sinningia*), cape primroses (*Streptocarpus*), *Columnea*, *Episcia*, and *Smithiantha*. There are roughly 1,500 species of gesneriads around the tropical and subtropical world. Members of the family are often easy to recognize - they tend to have fuzzy leaves attached in pairs (or in clusters at the bases of the plants) and have showy tubular flowers with the stamens (pollen-producing organs) in two pairs.

African violets belong to the genus *Saintpaulia*, which accounts for only a small portion of the Gesneriad Family. There are about 20 species of *Saintpaulia* found chiefly in and near the Usambara Mountains in Tanzania, frequently on ledges, cliffs, and other rocky places.

Considering their popularity, it is surprising that African violets have not been in cultivation for even a century. In 1892, Baron Walter von Saint Paul, the governor of what was then known as East German Africa, realized that what we now call African violets would stir up interest in Europe and sent seeds to his father Baron Ulrich von Saint Paul in Germany. A plant enthusiast, the father grew the first African violets in Europe and donated their seeds to the Royal Botanic Gardens of Germany. The director there, Hermann Wendland, named the genus he established for the new discovery *Saintpaulia* in honor of the Saint Pauls who so astutely recognized its value.

The species Hermann Wendland introduced in 1893 was *Saintpaulia ionantha*, which is regarded for the most part as *the* African violet species. It is pretty much the original stock behind their enormous popularity and diversity. The story involves one complication, however. The Saint Paul's did not know it, but their initial seed collection included, not one, but two very similar species. It turned out that what was once thought to be just *Saintpaulia ionantha* was mixed with the appropriately named *Saintpaulia confusa* (sometimes wrongly called *Saintpaulia diplotricha*, which is yet another species introduced only recently to cultivation). *Saintpaulia confusa* thus has been with us incognito since the beginning of African violet history. Differences between *Saintpaulia ionantha* and *S. confusa* are subtle: the former has shorter fruits and has hairs of just one length on the leaves (rather than in two tiers).

The irony of African violets is that, while there are over 40,000 cultivated varieties worth $30 million in world trade annually, they are disappearing from the wild. *Saintpaulia ionantha* ranks among the world's dozen most endangered species. The home region of African violets in and near Tanzania is a patchwork of specialized mountain forest and coastal habitats moister than the surrounding country. The need for farmland and lumber is so acute there that African violet habitats, along with habitats of other unusual plants, are being cleared.

The threat is severe but not ignored. Conservation groups have taken strong interest, and botanical research in the area is taking place. For example, botanist Jon Lovett, now working in Tanzania for the Missouri Botanical Garden, in 1983 found a new population of wild *Saintpaulia ionantha* in the Uzungwa Mountains about 400 kilometers south and a little west of Baron Saint Paul's original site. Such discoveries can help preserve the species, although even the region around the newly discovered site is being lumbered heavily.

Even a little familiarity with African violets can spark amazement at the range of sizes, forms, and flower colors derived from just one (oops, two) species. In cultivation, the flowers range from almost white to deep violet or maybe reddish. Wild *Saintpaulia ionantha* has pale to deep violet flowers (they are deep violet in Dr. Wendland's illustration). Additional species have found their ways into cultivation, each with its own range of variation in shapes, sizes, floral colors, and growth requirements. As these are selected and crossed, the already wide world of African violets will broaden further. For a peek into the African violet future don't miss the species section of the African violet show at the Garden April 25 and 26.

In writing this article, it is my hope that African violet owners, remembering a sharp-eyed baron stationed in Africa a century ago and contemplating the present predicament of the wild species, will find their saintpaulias even more entrancing. If you do not have an African violet but are considering investing in one, perhaps ending with a few extra incentives will help tip the balance: they are inexpensive and easily obtained; they propagate readily (rooting from detached leaves); they flower throughout the year; and they tolerate "house" conditions.

— George K. Rogers, Ph.D.
Horticultural Taxonomist

Ask the Answer Service

Flamingo Flower Isn't Flowering

Do you have a plant question? Call the Horticultural Answer Service, Monday through Saturday, 9 a.m. to noon at 577-5143.

Q. My Flamingo Flower from Hawaii isn't flowering. I've had it for two years now. I keep it in a nice bright north window on a shelf over the kitchen sink so it gets plenty of humidity. What's wrong?

A. Your Flamingo Flower *(Anthurium scherzeriarum)* isn't getting enough light. Provide at least four hours of curtain-filtered sunlight from a bright south, east or west window. In the winter, some direct sunlight is beneficial. Anthuriums do best in humid air, prefer to be pot-bound and like their soil moist but not soggy. Feed at regular intervals from late February through July with a dilute liquid fertilizer.

Q. I'm planning on growing and drying my own herbs this year. How long will dried herbs keep?

A. Dried herbs should keep for a year or more if stored under favorable conditions. Resist the temptation to keep them handy over the stove where temperatures and humidity will be higher. A cool shelf out of direct sunlight is good. Test herbs by crushing a few leaves. If the scent is good, so is the flavor.

Q. The past two years I've potted up my thriving Rosemary plants in fall only to have them die over winter. What do I have to do to keep them alive?

A. Rosemary should have at least four hours of direct sun from a south window in the winter. Water thoroughly and discard the drainage. Too wet soil can cause root rot. Let the plant approach dryness before watering, but don't allow it to become entirely dry. Cuttings taken from stems or shoots that have recently matured can be made in late summer for overwintering indoors and large plants will do nicely if heeled into cold frames and mulched with straw.

Q. At the Garden's Holiday Flower Show you had these plants with glossy, dark green leaves and delightful little fragrant creamy flowers. What were they?

A. Those were Sweet Olive (*Osmanthus fragrans*) and they make a wonderful houseplant. Native to Asia, they are grown extensively in the Orient for scenting tea. *Osmanthus* blooms year-round and will flower if grown in full sun, partial shade or under artificial light. They thrive over a broad range of temperatures and like it cool in winter. As rugged and durable as a houseplant can get, they are not easily found on the market but are well worth the search. Visitors to the Garden can enjoy large specimens of *Osmanthus fragrans* in the Linnean House and also in the Climatron by the portico steps.

Q. My seed catalogs have arrived and some are selling these Hardy Kiwis. Will they grow in St. Louis?

A. Yes. Hardy Kiwi (*Actinidia arguta*) will survive our winters quite easily. Whether they will fruit or not remains to be seen. Most varieties presently available take three or more years after planting before beginning to bear fruit. They are so new to our market that it will be a couple of years before present plantings reach bearing age.

Much research being conducted on *Actinidia* is focusing on developing larger fruiting plants on more compact vines that bear at an earlier age. Vines are either male or female so you must plant one of each to get fruit. Space them within 35 feet of each other or plant both in the same hole and let them ramble together. Any trellis that will support grapes will suffice for Kiwi. Give Kiwi full sun and well drained soil. Water during dry spells, prune lightly in summer and heavily in late winter.

Q. I'm interested in growing vegetables in containers. Is is possible to get good yields from pots?

A. Yes. More and more people are growing vegetables and flowers in containers, and plant breeders have been hard at work developing suitable varieties. Virtually the whole spectrum of vegetables contains varieties specially bred for small spaces. Look for "dwarf" or "bush" type varieties when planning your garden. All containers should have soils or soil mixes with good drainage. Drain holes are essential. An excellent book on the subject is "Gardening in Containers" by Ortho Books and it has a large list of proven varieties and other tips for success.

Q. I received a potted Azalea for a gift. How do I care for it?

A. Keep in a bright southeast or southwest window in winter. Prune when flowers fade, keep evenly moist but not soggy, and fertilize with an acid formula only when growing actively. Summers may be spent outdoors with an eastern exposure. Sink the pot into the soil to keep the roots cool. In the fall when frost threatens bring them into a cool, bright windowsill. Days should be no warmer than 70° and and nights 45° to 60°. Azaleas should rest between September and January: cease fertilizing and slowly diminish watering to keep soil just barely moist. Buds will form if temperatures are kept cool.

Q. I loved the wildflower meadow at the Garden last year and would like to try one myself. Was that grown from seeds or plants?

A. That particular garden was a commercially available "Midwest Mix" and was grown from seed. There are many types of wildflower gardens for shade, sun, those consisting of common annual or perennial wildflowers and native wildflower gardens. The advantage of using native wildflowers is that you utilize plants that are fully adapted to your specific area whereas mixes may contain seeds of poorly adapted or, worse yet, invasive aliens. Many nurseries specialize in wildflowers. Seek out nurseries that propagate their plants from seed or nursery stock rather than selling plants dug from the wild. Two good books available are "Growing and Propagating Wildflowers" by Harry B. Phillips and "The Wildflower Meadow Book" by Laura C. Martin (targeted for residential landscapes.)

— Chip Tynan, Ask the Answer Service

Earthkeepers

THE oil lamp-lit dining room of the log cabin at the Earthkeeper Training Center is buzzing with activity and excitement as a class of fifth grade students busily work on a class mural.

The leader quietly enters and motions the first small group of five students to follow him out into the cool night air. This is the moment they have been waiting for this first day at the Earthkeeper Training Center; the moment when they will ceremoniously receive their first coveted key, unlock the first of four boxes, and discover the first secret meaning of becoming an Earthkeeper. This first key represents knowledge gained about the flow of sunlight energy through the systems of life, the cycling of life's basic building materials, interrelationships in the web of life, and how interrelationships change through time.

Some distance from the cabin, the small group of students and leader circle around a candle lantern. While the leader reinforces the learning for that day, he hands each child a shiny new key with the letter "K" stamped indelibly on it. The leader then asks the group a question that will be repeated often during their stay, "Why can you not do just one thing"? In unison the children reply, "Because all living things on the earth are connected!"

The location of this first box is then revealed to be in the base of a hollow tree a short distance away. In a flurry of excitement that can scarely be contained, the first small group of Earthkeeper trainees sets out to find the box, their chitter-chatter eventually blending with the symphony of night sounds that fills the air.

The Earthkeeper Program at Shaw Arboretum is a carefully crafted, exciting two and one-half day learning adventure for upper elementary age students that focuses on developing broad-based ecological understandings, on deepening feelings for the earth and its life, and on helping change lifestyles to be more in harmony with systems of life.

The participants earn their first two keys at the center but must complete tasks at home and school to finish the program. These include lessening impact tasks such as conserving energy and materials, deepening feelings tasks such as spending reflective time alone in the natural world at their own "magic spot," and sharing their knowledge and experiences by recreating the concept activities for friends or family. It will take the participants a month or more to complete these tasks, earn their last two keys, and become Earthkeepers Level 1.

A low impact lifestyle at the Arboretum's resident facility contributes to the experience. Vegetarian meals are low on the food chain and water is carried in. Wood heat and oil lamps are used.

The Earthkeepers program contains certain qualities that defy statistical analysis. Facts can be measured but how does one measure an emotional response to a sunrise, or a re-inspired sense of wonder for life's mysteries — the awesome, yet joyous systems in which each of us are bound up with every other living thing on earth? These, perhaps more than facts, will help develop patterns of thoughtful action which will persist for our learners throughout life.

A recent Earthkeeper trainee shared with us her experience . . . "Thanks so much for putting your other things aside to help us earn our keys and show us the ways of nature for the time that we were there. I had a great time there and my sister can't wait to go.

My keys are in a safe place and I am starting to work on my "Y" key. I think that I have found the perfect magic spot and I go there whenever possible.

I am *much* more careful about wasting paper, water, electricity, and food and I have gotten my family to be careful also. It was a great experience."

— *Gary Schimmelpfenig,*
Education Instructor

Seeds Available

For Members interested in growing prairie grasses and wildflowers, small packets of seeds of selected species are available for purchase in the Visitor Center at Shaw Arboretum. In general, prairie plants are drought resistant perennials and require maximum sun.

Loop Road to Open

Due to the favorable response from visitors, Shaw Arboretum will open the trail house Loop Road, not only on Wednesdays but Thursdays as well, for those who find walking difficult.

For safety reasons, visitors are asked to stop and register at the Visitor Center. From April 1 through June 10, the Loop Road will be open to vehicles from 8 a.m. to 4 p.m. Many beautiful spring flowers will begin blooming during these months. For more information, please call the Arboretum at 577-5138 or 742-3512.

MARCH-APRIL

DAY-BY-DAY

MARCH

Sunday Tours

Beginning March 1 and each first Sunday of the month thereafter, the Garden Guides will conduct a tour beginning at 2 p.m. The tours start at the Ridgway Center and feature what is in bloom and special for that time of the year. They are walking tours, so wear comfortable shoes. The tour is free with Garden admission, and tickets may be obtained at the Ridgway Center one hour before the tour. For reservations, please call 577-5140.

1 **Spring Gardening Fair**
9 a.m. to 5 p.m., Sun., Ridgway Center. The last day of informational lectures and exhibits on gardening. Cosponsored by St. Louis Post-Dispatch.

Signs of Spring
2 p.m. Sun. Ridgway Center and grounds. A walking tour conducted by the Garden Guides. Free. For reservations, call 577-5140.

1 **Orchid Show**
9 a.m. to 5 p.m., daily, Orthwein Floral Hall. Annual show with a New Orleans French Quarter theme. Through April 5.

7 **Tree Conservation at the Garden**
2 p.m., Sat., Shoenberg Auditorium. Dr. George Rogers will present a very interesting slide show and lecture on the Garden's efforts to preserve its historic trees. For Members Only. Free.

7-29 **Student Art Exhibit**
9 a.m. to 5 p.m. daily, Monsanto Hall. Photographers, illustrators, and graphic designers from the Create Studio at Washington University's School of Fine Arts will display their creative interpretations of the Missouri Botanical Garden. The exhibit will offer a unique view of the Garden through the eyes of a variety of artistic styles and media.

11 **Opening Night on the Admiral**
6:30 p.m. to 10:30 p.m., Wed., S.S. Admiral. A gala evening to welcome back this historic vessel. Proceeds benefit the Garden, Art Museum and Symphony. Tickets by advance reservation.

20 **First Day of Spring**
Fri., Come visit the Garden and enjoy what should be warmer weather, as well as some early blooming flowers, especially in the Samuels Bulb Garden.

26 **Lecture: Modern Tree Care**
8 p.m., Thurs., Shoenberg Auditorium. Arborist Dr. Alex Shigo will discuss how to evaluate and treat tree problems. $4 Members, $5 nonmembers.

APRIL

4 **Sir Peter Smithers Exhibit**
9 a.m. to 5 p.m. daily, Ridgway Center. A spectacular macrophotographic exhibit (5 ft. by 3 ft. photos) of Japanese tree peonies. Through May 3.

4 **Panorama of Puppetry**
9 a.m. to 5 p.m., Sat., Ridgway Center, A full day of puppetry including roving puppeteers, workshops, storytelling and puppet shows. Free with regular Garden admission (except workshops, $4 per person; and puppet shows, $1 per person). Advance reservations for workshops can be made by calling 577-5125 beginning March 23. Panorama of Puppetry is sponsored in conjunction with the St. Louis Puppet Guild.

5 **What's Blooming?**
2 p.m., Sun. Ridgway Center and grounds. Tour of the grounds and greenhouses by the Garden Guides emphasizing what is in bloom and especially worth seeing at this time of year. Free. For reservations call 577-5140.

7 **Spring Lecture Series**
1:30 p.m. and 7:30 p.m., Tues., (First of four lectures — others are April 14, 21 & 28), Shoenberg Auditorium. Kick off for annual lecture series with this year's theme being the natural history of South America, and natural plant communities of the United States and the St. Louis region. Today's lecture is

entitled "Natural History of the Amazon Region" by Elaine Alexander, an instructor at Mary Institute. Free.

10 **Arbor Day Celebration**
9 a.m. to 5 p.m., Fri., Ridgway Center Ticket Counter. Free tree seedlings (either deciduous holly or red bud) will be distributed to the first 1,500 visitors to the Garden.

Auction and Sale
8 p.m. to 10 p.m., Fri., Ridgway Center. A once-in-a-lifetime opportunity to purchase a variety of plants and services from the Garden. Watch your mail for details.

11 **Children and Dad's Day at the Garden**
10 a.m. to 3 p.m., Sat., Ridgway Center. Storytelling, entertainment, fun and more await the Garden's youngest Members. For Members Only. Watch your mail for details.

14 **Spring Lecture Series**
1:30 p.m. and 7:30 p.m., Tues., Shoenberg Auditorium. "Ecuador and the Galápagos Islands" by Patty Hecker, archeologist and world traveler. Free.

21 **Spring Lecture Series**
1:30 p.m. and 7:30 p.m., Tues., Shoenberg Auditorium. "The Garland of Generations" by Patty Bush, president of the Garden Club of St. Louis, and by Dr. George Rogers, horticulture taxonomist for the Garden. Free.

23-28 **Spring Plant Sale**
9 a.m. to 6 p.m. Thurs. and Fri., 9 a.m. to 5 p.m., Sat.-Tues., Ridgway Center parking lot. Substantial discounts on bedding plants, herbs, gift items and lots more.

25 & 26 **African Violet Society Show and Plant Sale**
1 to 5 p.m. Sat., 9 a.m. to 5 p.m. Sun., Ridgway Center. Thirty-third annual display, competition and sale with this year's theme of "Violets in Prime Time." Free with regular Garden admission.

28 **Spring Lecture Series**
1:30 p.m. and 7:30 p.m., Tues., Shoenberg Auditorium. "Natural Plant Communities of the Past and Present in St. Louis" by Virginia Wallace, a botanist with the Missouri Department of Conservation. Free.

MARCH-APRIL

COURSES & LECTURES

AT THE GARDEN

NOTE: Class descriptions and registration information for spring courses can be found in the *1987 Spring Courses and Lectures* brochure which was mailed to all Members in January. For more information call the Education Department at 577-5140.

MARCH

2(M)	Gardening Techniques *(6 sessions)*
	History of Garden Design *(5 sessions)*
	Plants and Nutrition *(4 sessions)* - Clarkson
3 (Tu)	Home Landscape Design *(5 sessions)*
	Lawn Care *(4 sessions)*
	Growing Azaleas
4 (W)	Pruning Indoor Plants
5 (Th)	Designing a Home Herb Garden *(3 sessions)*
7 (Sa)	Eagles and Waterfowl Trip
	Science Experiments
9 (M)	Nature Photography *(5 sessions)*
10 (Tu)	Planting and Pruning Roses
	Hostas and Shade Plants
11 (W)	Basics of Contemporary Floral Design *(3 sessions)*
	Vegetable Gardening *(2 sessions)*
	Training and Pruning Fruit Trees
12 (Th)	Dwarf Evergreens
	Small Ornamental Trees
14 (Sa)	Home Orchid Culture
	Planting for Success
	Compost Workshop
15 (Su)	Growing African Violets from Seed
19 (Th)	Trees for St. Louis
	Perennial Garden Design *(2 sessions)*
21 (Sa)	Desert Dish Gardens
24 (Tu)	New and Little Known Perennials
25 (W)	The World of Annuals
	Rocky Mountain Flowers
26 (Th)	Plants for St. Louis Rock Gardens
28 (Sa)	Pioneer Prairie Plants
31 (Tu)	Summer Bulbs

APRIL

1 (W)	Growing Small Fruits Perennials *(3 sessions)*
	Propagating Outdoor Trees and Shrubs *(2 sessions)*
2 (Th)	Ornamental Grasses
	Selection and Use of Pesticides
	Birding for Beginners *(3 sessions)*
4 (Sa)	Flower Garden Design *(4 sessions) - Clarkson*
6 (M)	Growing and Using Herbs *(3 sessions)*
7 (Tu)	Aquatic Gardening
	Plant Classification *(2 sessions)*
8 (W)	Home Tree Fruit Culture
9 (Th)	Peonies and Daylilies
	Garden Weed Control
12 (Su)	Torn Paper Pictures
15 (W)	Garden in Watercolor *(6 sessions)*
23 (Th)	Planting for Birds and Butterflies
25 (Sa)	Pruning Ornamental Shrubs
29 (W)	Wild Flower Identifications *(3 sessions)*

AT THE ARBORETUM

MARCH

6 (F)	Nocturnal Awareness Hike
7 (Sa)	Maple Syrup
13 (F)	Nocturnal Awareness Hike
24 (Tu)	Spring Wildflower Walk
31 (Tu)	Spring Wildflower Walk

APRIL

3-4 (F-Sa)	Muir Trek
7 (Tu)	Spring Wildflower Walk
10 (F)	Nocturnal Awareness Hike
11 (Sa)	Wildflower Walk with Edgar Denison
	Nature Photography *(2 sessions)*
14 (Tu)	Spring Wildflower Walk
21 (Tu)	Spring Wildflower Walk
24 (F)	Nocturnal Awareness Hike
25 (Sa)	Ethnobotany
26 (Su)	Afternoon Wildflower Walk
28 (Tu)	Spring Wildflower Walk

IN MEMORIAM

Samuel D. Soule, M.D.

Garden Members and staff were saddened to learn of the death, October 29, 1986, of Dr. Samuel D. Soule.

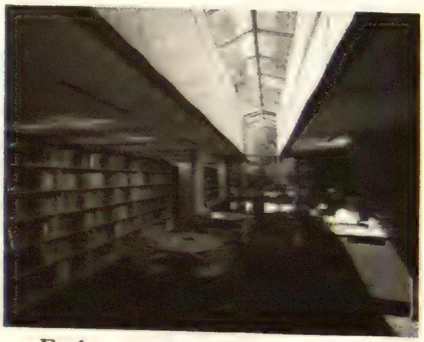
Dr. Soule, 82, was known to many for his kindness, humor and wit. A physician since 1928 specializing in obstetrics and gynecology, Dr. Soule delivered thousands of babies in the St. Louis area and often cared for several generations of women from the same family. An avid medical historian, Dr. Soule wrote many articles on the early history of medicine in the St. Louis area, including Henry Shaw's scientific advisor, physician and botanist George Engelmann.

In 1984, he and his wife, Selma, established the Samuel D. Soule Center for Senior Citizens at the Garden. Tributes to the Garden in memory of Dr. Soule are listed on page 19 and will be used to further the activities of the Samuel D. Soule Center for Senior Citizens.

Surviving are his wife, a daughter, Barbara, and a son, Oscar.

FROM THE LIBRARY

Gifting the Garden — A John Allan Love Foundation Tradition



Each year since 1977, the John Allan Love Foundation has remembered the Garden with a generous gift. In 1986, the Foundation provided funds for Part XIII of *Banks' Florilegium. Banks' Florilegium* is popularly referred to as "the Captain Cook prints" because it is a record of plates collected on Captain Cook's first around the world voyage, 1768-1771. It is being collected by the Garden library through the generousity of benefactors such as the John Allan Love Foundation.

Banks' Florilegium consists of 738 beautifully crafted and botanically important engravings issued in 34 parts. The Garden now has the 24 published parts, with the remaining ten parts expected to be published prior to 1990. The engravings are printed in color for the first time from the original 18th-century copper plates. These historic plates depict some of the first plants to engage the scientific attention of European voyagers in the Pacific Ocean, including the very first plants of New Zealand and Eastern Australia ever to be gathered and studied by Europeans.

In addition to the John Allan Love Foundation, the Garden also extends thanks to other individuals and groups who are making possible the purchase of *Banks' Florilegium.*

Samuel D. Soule Center for Senior Citizens

The Samuel D. Soule Center, a unique horticulture program for area senior citizens, was begun in 1984 by a grant from Dr. and Mrs. Samuel D. Soule, who recognized the senior citizen's need for active educational programs. The center provides educational "hands on" programs for individuals and groups that are able to come to the Garden. And, for groups unable to visit the Garden, the center offers a selection of export programs. All programs are free of charge.

In 1986, nearly 700 senior citizens participated in programs at the Garden including: Herbs for the Home, New Plants from Old, Oriental Wok Cooking, Spices, and Wreath Making. Also, in the past year, 3,655 senior citizens were reached in area senior citizen facilities with export programs about the Missouri Botanical Garden and the fascinating world of plants.

To receive more information on the Samuel D. Soule Center for Senior Citizens, call 577-5140 and request the current brochure.

If you are interested in supporting this on-going program with your contribution, please call 577-5120 for more information or send it to the Development Office, Missouri Botanical Garden, P. O. Box 299, St. Louis, MO 63166.

French Botanist Visits Garden

Professor Philippe Morat of the National Museum of Natural History in Paris, recently visited the Garden to discuss plans for expanding several important collaborative projects with members of the Garden's research staff working in Madagascar, Cameroon, and South America, and to study new ways in which the two institutions can increase cooperation even more in other areas. Professor Morat, (left), is seen here with Dr. Porter P. Lowry II, who heads the Garden's Madagascar Research Program.

Trustee Profile

HARRY E. WUERTENBAECHER, JR., AND JOSEPH H. BASCOM

Trustees Wuertenbaecher and Bascom

Two members of the Board of Trustees were honored for their service to the Garden in January. Harry E. Wuertenbaecher, Jr. has served on the Board for 23 years and Joseph H. Bascom has been a member for 15 years.

Mr. Wuertenbaecher was appointed to the Board in October, 1963 and served as President from 1967 to 1970. "I've served with three directors and I've seen tremendous growth under each one," he said. "Also, this board is as dedicated and hardworking as any on which I've had the privilege to serve."

He is employed as Vice President for Public Relations at Union Electric Company and is also a member of the boards of directors of Lindell Trust Company, Downtown St. Louis, Inc., the Arts and Education Council, Deaconess Hospital and the YMCA. "When I was on what is now the Members Board we had something like 2,000 Members," he said. "Now it is up to almost 19,000 and that shows the tremendous support of the people of St. Louis for the Garden."

Elected to the Board in 1971, Mr. Bascom served as Second Vice President in 1972 and as President from 1973 to 1975. In addition, he has served as chairman of the Finance and Retirement Committees and is currently on the Arboretum Committee. He is the retired Chairman of the Board of Broderick and Bascom Rope Company and is on the board of directors of Centerre Trust Company. He is a former director of General Steel Industries, Missouri Pacific Corporation and the Missouri Historical Society.

Reflecting on his time on the Board of Trustees, Mr. Bascom said, "We went from a struggling operation where we could hardly afford to sweep the leaves off of the sidewalk to a new leadership which has made the Garden a respected institution world wide. The support of our Members and the public has made it all possible."

From the Garden Gate Shop

Book Review/*State of the Ark*

We are all very much aware of the problems of overpopulation, dwindling resources, and environmental abuse taking place in our world today. Now, Lee Durrell tells about the worldwide efforts to alleviate these problems.

The State of the Ark is a detailed and striking documentary of the conservation movement — its failures, its successes and its hopes for the future. In a series of case studies, photographs, maps and illustrations, we learn about the water crisis in the southwestern United States, kangaroo harvests in Australia, extensive damage to the Alaskan tundra and the deforestation of China. We discover what these mean to our future and what steps are being taken to correct these problems.

Ms. Durrell describes the multitude of people involved in the conservation movement as Noah's Army, united under the banner of the World Conservation Strategy. Noah's Army includes a diverse group, from the Chipko Movement, a Hindu sect that protects trees due to religious beliefs, to the World Wildlife Fund.

An eye-opening but encouraging work, this book is a must for all who are concerned about our planet's future. *The State of the Ark* (published by Doubleday) is available in the Garden Gate Shop in both hardcover ($22.95) and paperback ($14.95). — *Sharon Wilson Baebler*

Easter's Coming

We have potpourri, soap, flowers and lovely crystal vases. Children will be delighted with our baskets, wooden eggs and fluffy bunnies. Our garden statuary and fountains are perfect for every spring garden.

Spring Extravaganza

April 23 - 28

A circus of a sale in the Garden Tent on the West Parking Lot, featuring:

Bedding Plants
Herbs
Perennials
Roses
Flowering Shrubs
Summer Blooming Bulbs

Also lot of new, exciting gardening items and statuary.

Members Save 20%

Members' Pre-sale Thurs. & Fri.
April 23 & 24, 9:00 a.m. to 6:00 p.m.

Public Sale Sat. & Sun.
April 25 & 26, 9:00 a.m. to 5:00 p.m.

Clean-up Special Mon. & Tues.
April 27 & 28, 9:00 a.m. to 5:00 p.m.

One big sale this year instead of separate sales for April and May. Watch for your spring mailer.

FROM THE MEMBERSHIP OFFICE

New to the Garden's Members Board are, left to right, June Kummer, Thomas Schweizer, Maggy Beaubein, D'Arcy Elsperman, Frederick Atwood III, Mary Ries, James Schneithorst and Ginny Senkosky.

Record Numbers for Membership

The Missouri Botanical Garden is celebrating the fact that 1986 was a banner year for the membership program. The membership totaled 18,490 at year's end, an increase of over 2,000 Members from 1985. This 12 percent increase in Members is outpaced only by an 18 percent increase in membership revenues for the Garden. The loyal Members of the Garden contributed $919,000 for the Garden's support. Members were also visiting the Garden in record numbers during 1986. Members visited the Garden's many activities, events, flower shows, or just strolled the grounds and gardens nearly 104,000 times. This is an increase of 43 percent from the previous year.

Any institution is only as great as the people who support and enjoy it. The Members of the Missouri Botanical Garden make this a premiere cultural institution of the city and the nation!

Remember Mom!

It's not too early to start thinking about your plans for Mother's Day, May 10. Remember Mom with a gift membership to the Missouri Botanical Garden. It's a gift that will make a lasting impression. With each Mother's Day gift membership, mothers will receive a lovely hand-embroidered Swiss floral handkerchief. Order your memberships today by phone, 577-5118, or with the membership application below. Give her the Garden and let her know how special she really is!

THE GARDENS AND CASTLES OF SCOTLAND

June 17 to June 30, 1987

This summer the Members of the Missouri Botanical Garden will have the opportunity to join a beautiful trip to Scotland. This fourteen day trip will be led by Mr. Alan Godlewski, chairman of the Horticulture department, at the Missouri Botanical Garden.

Our unique tour will feature Scotland's gracious capital of Edinburgh, the delights of Royal Deeside, the ravishing scenery of the Highlands and the ancient forest land of the Southwest, so rich in Scottish history. Many of the great gardens of Scotland are included in our itinerary as well as private gardens to which we have been specially invited. These private gardens, seldom open to the public, will be shown to us by their distinguished owners and we will experience the renowned Scottish hospitality while being entertained in lovely castles and houses as we travel through the invigorating countryside.

This wonderful tour is being planned specially for the Garden by Judy Peil Travel Inc., and reservations are limited. The tour price is $3,650 for land arrangements. To make reservations call Judy Peil Travel at 726-2577. We hope you will be able to join us for this exceptional trip!

GIFT MEMBERSHIP ORDER FORM — *Please mail at least three weeks prior to occasion:*

☐ *Birthday* ☐ *Mother's Day* ☐ *Other* ________________

Gift To:

NAME ________________

ADDRESS ________________

CITY ________ STATE ____ ZIP ______

TELEPHONE ________________

Sign gift card: ________________

Date Needed By: ________________

Regular Membership $35. Contributing Membership $75.

For more information call 577-5118.

Gift From:

NAME ________________

ADDRESS ________________

CITY ________ STATE ____ ZIP ______

TELEPHONE ________________

☐ Enclosed is my check for $ ________

☐ Please charge: VISA No. ________

MasterCard No. ________

Name as it appears on card: ________

Expiration date: ________

Please make checks payable to: Membership Office, Missouri Botanical Garden, P.O. Box 299, St. Louis, MO 63166.

ECUADOR AND THE GALAPÁGOS

July 22 to August 1, 1987

The Missouri Botanical Garden is proud to present a natural history tour of Ecuador and the Galápagos Islands. This ten-day tour will be led by Dr. Cal Dodson, director of the Río Palenque Tropical Research Station and botanist with the Missouri Botanical Garden. The ten-day tour will be a natural history treat to be enjoyed by Members of all ages. The dates of the tour are July 22 to August 1, 1987. Just a sampling of the events include:

- A visit to Quito, which was the northern capital of the Inca Empire. Today it is the capital of Ecuador and has a legacy of splendid architecture.
- Visit the exciting marketplace of the Saquisli Indians.
- Visit the Río Palenque Tropical Research Station in the rich rainforest belt of western Ecuador and, of course, the spectacular natural wonders of the Galápagos Islands.

The cost of the trip is $2,150 per person and reservations can be made by calling Dana Hines at 577-5108. All Members will be receiving a complete itinerary and description of this excursion by mail in the near future.

A Challenge Matched

The Times Mirror Foundation challenged the Members of the Missouri Botanical Garden and new Members as well to support the Garden in a manner above and beyond their usual degree of support. The Times Mirror Foundation did this by offering to match membership contributions above the $35 level in the amount of $25,000 to be completed within one year beginning in 1986.

The Membership Department is very proud to announce this challenge has been met by its Members in only *four months.* In that period of time, 254 Garden Members have upgraded their membership and 99 Members have joined at upper levels. The Garden sincerely thanks the Times Mirror Foundation and its supporting level Members.

Plant Talk From the Gardenview Restaurant

Bananas

FOOD FACTS:

Bananas appear to have originated in southeast Asia, spreading to India, Africa, and finally to tropical America, which now supplies the bulk of the world's commercial shipments. Bananas (*Musa* spp. and cultivars) are depicted in cave-temple wall-paintings in India that can be traced to 500-600 B.C., so they were cultivated at this time if not earlier.

The Spanish and Portuguese first brought this valued plant to America. Ecuador, Honduras, Costa Rica, and Panama are the leading banana-producing countries. The United States, Japan, West Germany, France, and the United Kingdom are the chief banana-importing countries.

Bananas, both the sweet desert cultivars and the starchy cooking plantain types (*Musa Xparadisiosa L.*) are important food items throughout the tropics. Cooking bananas, however, are not frequently found in temperate zone markets while eating bananas arrive at the world's markets the year around.

When you visit the Climatron, look for the banana plants. The banana fruit does not grow on a tree, but grows from a giant herbaceous plant with an underground, horizontal stem rhizome from which roots develop. This perennial plant is a monocot (Family Musaceae).

The pseudostems, which reach a height of up to 20 feet, comprise many overlapping leaf sheath bases. New rolled leaves emerge through the center of the previous overlapping leaf bases. After about 40 leaves have been produced, about nine months after planting the sucker, the plant enters a reproductive phase and the vegetative apex inside the leaf sheath changes to a floral apex. The floral apex grows very rapidly, pushing the inflorescence out of the top of the pseudostem. Each inflorescence contains five to 13 groups of flowers or "hands." The hands are made up of double rows of "fingers" and are enclosed in a floral bract.

As it matures, the inflorescence turns and hangs downward because of its weight so that the developing banana fruits are at the top of the inflorescence stalk and the nonfruiting sterile portion below. The fingers gradually turn upward and, in cultivation, the non-fruiting inflorescence tip is often removed so as not to attract insects.

Fruits mature for harvest in about three to four months and are generally harvested when the fruits are hard and solid green. The fruits do not ripen well if left on the plants. The banana's "hands" are cut into clusters of four to 16 "fingers" for shipping in polyethylene-lined cartons. The natural ripening of bananas is enhanced in cold storage areas with the gas ethylene, giving them their yellow color for the marketplace.

FOOD TIPS:

Banana Pops

1 envelope of low-calorie whipped topping mix
1 cup skim milk
1/3 cup orange juice
1 medium ripe banana, mashed
1 tablespoon packed brown sugar
1 teaspoon vanilla
grated peel and juice of 1 lemon

Prepare whipped topping mix according to directions. Stir in remaining ingredients. Beat on low speed until smooth; about 30 seconds; pour into twelve - 5 oz. paper cups or paper-lined medium muffin cups, freeze until mushy; about 2 hours. Insert wooden sticks and freeze until firm, 5 to 16 hours. 12 pops.

Kids' Tip:

The leaves of the banana are considered one of the largest photosynthetic structures found on any plant in the world. The banana is a highly nutritious food, higher in energy value than most fruits.

The banana is rich, like tomatoes and oranges, in Vitamins B and C, and also contains potassium, iron, phosphorus and calcium. It has a high content (20%) of sugars that makes it very nutritious. The considerable amount of Vitamin A also promotes digestion. Bananas can be eaten fresh, served with dates, or dipped in melted chocolate as a dessert fondue.

— Dr. Kenneth Laser
Chairman, Education Department

For Younger Members

The Winds of March

The winds of March are blowing, The winter stopped its snowing, April rains will soon be here and May flowers will appear.

You have probably listened to many sayings about spring winds and especially the March wind. Have you ever heard someone say, "If March comes in like a lion, it will go out like a lamb"? They are talking about the blustery days of March that slowly turn into spring.

People pay a lot of attention to the wind, because it is important in bringing us our change in seasons and weather. A long time ago people thought the wind was a magical spirit that came out of nowhere and changed our seasons.

Today we know the wind is really just air that has been warmed and cooled by the Earth's surface. During the day, heat from the sun is absorbed by the sea and land. The land gets warm much more quickly than the sea.

It doesn't take very long until the air close to the land becomes warm and starts to expand. As it expands, it becomes lighter in weight. The air over the sea is not as warm and is still heavy. As the warm air over the land expands and rises, cool air from the sea rushes in and pushes the warm air upwards. At night the reverse happens as the land cools off quickly and the sea stays warm.

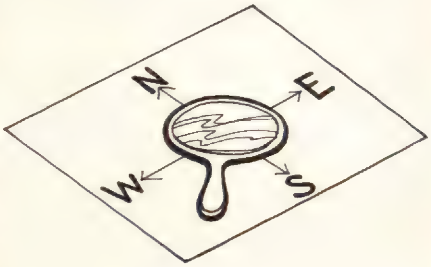
The wind is not just a sign of spring. It is also a very useful force. Throughout the years man has learned to harness the power of the wind in many practical ways. Sailboats use the wind to move through the water. Windmills are used to help pump water from wells and now there are wind turbine generators that make electricity.

Today scientists are exploring better ways of using the energy of the wind. The wind is a resource that can be used over and over again. It is renewable. But there is a problem, because some days the wind does not blow. It is also impossible to catch the wind and store it. Scientists are experimenting with new types of generators, sail cars and wind pumps. Someday the wind may give us much more than spring weather.

You can experiment with the wind like the scientists do. If you would like to learn the directions of winds that are high in the sky just try the following activity. (Mom and Dad can help.)

Materials:

8 inch cardboard square
crayon
ruler
mirror
clouds in the sky



1. Draw a line vertically in the center of your square.
2. Draw another line horizontally.
3. Mark the directions N, S, E, W on your cardboard square.
4. Put your mirror in the center of your square.

Take your mirror and square outside and place them on the ground. Make sure the "N" on your square is facing North.

Then with the reflections of the clouds in the mirror, notice which way they move. This shows how the wind is blowing at cloud level.

You may notice that low clouds blow a different direction than higher clouds. This shows that there are different winds blowing higher in the atmosphere.

— Stephanie Finke,
Education Coordinator

HENRY SHAW ACADEMY NEWS/ MAKING CONNECTIONS AFTER SCHOOL

How do flowers make seeds? How do seeds become plants? Why are plants important? Why do people study plants and how do they study them? These are among the many questions explored in "Science Connections," an after-school class offered to Henry Shaw Academy members, ages 7-13.

Last fall, Academy members, ages 7-9, met regularly at the Garden after school. They collected, sorted and examined seeds and leaves, and they conducted a variety of experiments on seeds and how they grow. Students observed, measured, weighed and recorded the seeds' growth and made predictions on what

continued on next page

Tributes NOVEMBER-DECEMBER 1986

In Honor Of:

Mr. Lester Adelson
Mr. and Mrs. Leon Bodenheimer
Dr. and Mrs. Max Deutch
Mr. and Mrs. Jack E. Edlin
Mrs. Henry L. Freund and Robert
Mr. and Mrs. Mort Isaac
Mr. and Mrs. John Isaacs, Jr.
Mrs. Harry W. Loeb
Mr. and Mrs. Louis G. Rothschild, Jr.
Dr. and Mrs. Hyman R. Senturia
Dr. and Mrs. Helman Wasserman
WLL Foundation

Mr. Ben Alper
Mrs. Ruth Schwartz

Mr. Adam Aronson
Mrs. Ben H. Senturia

Joseph N. Bacino
Mr. and Mrs. Charles Cook

Mr. and Mrs. Charles Baer
Mr. and Mrs. Harold S. Levy

Mr. Lester Bamberger
Mrs. A. L. Netter, Jr.

Mrs. I. Baumgarten
Mr. and Mrs. Melroy B. Hutnick

Mr. Walter Behrendt
Mr. and Mrs. D. Goodrich Gamble

Mr. Ralph E. Bishop, Sr.
Mr. and Mrs. Don Dallas

Gertrude and Arthur Bland
Jeffrey Balkin
Mr. and Mrs. David Langdon and Family
Mrs. Gertrude B. Platt and Family

Randee Blum
The Platzers

Mr. Louis Cassett
Mr. and Mrs. Henry W. Dubinsky

Mr. Art Christ
Mr. Leonard W. Blake
Rose Ann Bodman
Mrs. J. Butler Bushyhead
Dr. and Mrs. Alex M. Cole
Mr. and Mrs. Richard Coles
Mr. and Mrs. Edgar W. Denison
Roberta DeRiel
Mrs. Margaret Frigley
Ms. Peggy H. Gibstine
Miss Elizabeth Goltermann
Mr. and Mrs. Lewis C. Green
Mrs. James Holsen
Miss Helen A. Mardorf
Mr. John E. Molyneaux
Miss Sharon W. Morgan
Ms. Joan Murphy
Dr. Lillian Nagel
Mr. and Mrs. Robert Posen
Mr. and Mrs. Richard R. Russell
Mr. and Mrs. Cornelius F. P. Stueck
Rev. James M. Sullivan
Mr. and Mrs. Charles L. Tooker
Miss Dorothea Vogel
Mrs. William E. Wiese

Mr. and Mrs. Fred Cohen
Mr. and Mrs. Arthur E. Carlson

Mr. and Mrs. Herbert D. Condie, Jr.
Mr. and Mrs. John K. Wallace

Mr. and Mrs. Melvin Dubinsky
Mr. and Mrs. Henry W. Dubinsky
Mr. and Mrs. Richard T. Price, Jeff, Wendy, Katie

Mrs. Sylvia Epstein
Mr. and Mrs. S. E. Freund

Mrs. Evalyn Felton
Mr. and Mrs. Alvin F. Busse
Mrs. Phillip Evans
Mrs. F. P. Kohlbry
Mrs. G. P. Plaisance

Libby Fischer
Mr. and Mrs. Loren M. Knowles
Mrs. W. H. Millinger

Dr. Jerry Flance
Mr. and Mrs. Charles Cook

Mrs. Henry Freund
Mr. and Mrs. Myron Glassberg
Mr. and Mrs. Henry C. Lowenhaupt
Mr. and Mrs. Edward F. Ruprecht
Mr. and Mrs. Joseph F. Ruwitch
Mrs. Selma G. Seldin

Mr. and Mrs. Theo Haimann
Dr. and Mrs. I. Jerome Flance

Mrs. Maxine Jackoway
Mrs. Myra Blumenthal Kahan
Mrs. Frances Rothman

Mr. and Mrs. Rudolph Joenk
Mr. and Mrs. Arthur E. Carlson

Mr. and Mrs. Charles Jost
Mr. and Mrs. Robert T. Naumann

Dr. John Kendig
Mr. and Mrs. M. J. Grzesiowski

Mrs. Elmer Kiefer
Mrs. Raymond E. Lange

Mrs. Herbert Kipp
Mrs. Marvin Harris

Miss Susan Wightman Kobush
Mr. and Mrs. Tom K. Smith, Jr.

Mr. and Mrs. Martin Koshner
Mr. and Mrs. Arthur E. Carlson

Mr. Brian LeDoux
Orchid Society of Greater St. Louis

Mrs. Margie May
Mr. and Mrs. Lester R. Adelson

Mr. and Mrs. Jack Meletio
Ms. Florence G. Stern

Mr. Kenneth Miller
The Weeders And Seeders Garden Club

Betsy O'Herin and Edwin Paradoski
Mr. and Mrs. M. R. Forrester
Mr. and Mrs. J. Gordon Forsyth, Jr.
Mr. and Mrs. William M. Livingston

Mr. and Mrs. John Pflueger
Ruth E. Buerke
Frank M. Bush

Mr. and Mrs. Louis Putzel
Mr. and Mrs. Charles J. Cook

Dr. Peter H. Raven
Mrs. Henry L. Freund

Mrs. Evelyn Rosenbaum
Mr. and Mrs. Philip N. Hirsch

Mrs. Fred Sale
Mr. and Mrs. Myron Glassberg

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continued on next page

would happen next. Each class promised a new discovery as students checked the experiments with their predictions. At the end of the course, students took their experiments home, along with seeds, bulbs and roots to plant in their gardens.

"Science Connections" will be offered next fall for both 7-9 and 10-13 age groups. This class is especially recommended for those members interested in a science fair project using plants.

Path Finders

Could you find your way out of the woods with just a map and compass? That's what Henry Shaw Academy members had to do on a winter outing at Shaw Arboretum. With direction from Gary Schimmelpfenig, Arboretum educational instructor, students worked in groups to make their way through fields and forest using maps, compasses and teamwork to get them to their final destination. All teams turned up eventually at the Trail House where hot chocolate and a welcome fire awaited them. Members enjoyed sharing tales of their adventures, and the outing ended on a high note with participants solving a mystery from clues gathered throughout the day.

The Henry Shaw Academy

The Henry Shaw Academy is open to all area students, ages 7–18, interested in science, ecology and natural history. Membership is $15 a year, and some scholarships are available for certain classes. Students joining the Academy will receive a membership card, newsletters, invitations to special events and reduced fees for classes. Members who complete their first class will receive an Academy T-shirt. Additional awards will be made as members complete other levels of participation and achievement. For more information on membership call 577-5135.

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Plants To Remember

Witch Hazel

Ozark witch hazel (*Hamamelis vernalis*), Eastern witch hazel (*H. virginiana*)

There are several interesting and unusual aspects of this shrub that are worth noticing. The Ozark witch hazel is the first woody plant to come into bloom in Missouri. On sunny winter days, January through April, even in freezing temperatures, its yellow, star-shaped flowers can be found open, in clusters close to the stems. When cloudy, they close. Their sweet, delicate scent is a pleasant surprise.

The fruit capsule is woody and requires most of the year to develop. When mature, in the autumn, it pops open quite forcefully, shooting its black seeds up to 30 feet away. The seeds are rich in oil and are eaten by ruffed grouse, turkeys and squirrels.

The forked branches of witch hazel have been used as divining rods for seeking water. The twigs of Eastern witch hazel, a close relative of Ozark witch hazel, but an autumn-bloomer, provide an extract which is the source of the astringent "witch hazel" after-shave lotion.

Ozark witch hazel can frequently be found growing in gravel and rocky stream beds and at the base of rocky slopes along streams. Eastern witch hazel is less common, but occurs in rich woods on north-facing hillsides and in wooded valleys along streams.

Both can be seen here and there on the grounds of the Garden; the two can be viewed side-by-side near the sidewalk in the new Jenkins Daylily Garden.

— Peggy Wilmes, Plant Recorder

A Rare Opportunity

Something that anyone who has visited a Missouri Botanical Garden flower show has always dreamed of . . . owning some of the marvelous plants from the Garden's collection. This opportunity will be yours on the evening of Friday, April 10, 1987.

The construction of new greenhouses at the Garden will require the sale of many of the Garden's private collection of plants. On this festive evening a plant sale and auction will take place. Rare orchids and the coveted hoya wreaths, as well as horticultural services, will be auctioned to the highest bidders. Additionally, the Ridgway Center will be filled with many other plants for sale that evening.

The proceeds from this event will help restock the new greenhouses upon completion. Your invitation to this "rare opportunity" will arrive in the mail. Attendance at the sale will be free and open to all Members. The auction, however, will require reservations and a fee for the catalog. Watch for your invitation!

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Missouri Botanical Garden

BULLETIN

VOLUME LXXV, NUMBER 3 MAY-JUNE 1987

Springtime at the Garden

Inside This Issue

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Garden Director Peter Raven tells of the race against time to preserve and learn from the world's diminishing tropical forests.

8 Gardening at the Garden
The national flower, the rose, will be coming into bloom at the Garden in June.

10 Calendar of Events
Late spring and summer is an excellent time to attend some of the many activities being held at the Garden.

12 Ask the Answer Service
The Horticultural Answer Service is available to help solve your plant problems.

13 News from the Arboretum
Seeds were collected from the Experimental Prairie and used to plant an additional six acres.

16 For Younger Members
Go on a safari in your own back yard to investigate the fascinating world of insects.

17 Plant Talk from the Gardenview Restaurant
Tomatoes, the familiar "love apples," were not always loved.

18 Tributes
Friends and family honored with a contribution to the Garden.

On the Cover: One of the best ways to spend a pleasant spring day is to take a leisurely stroll through the Garden.
— *Photo by Pat Watson*

The BULLETIN (ISSN 0026-6507) is published bi-monthly except semi-monthly in May by the Missouri Botanical Garden, 4344 Shaw Boulevard, St. Louis, MO 63110. Second class postage paid at St. Louis, MO. Subscription price $12.00 per year. $15.00 foreign.

The BULLETIN is sent to every Member of the Garden as one of the benefits of membership. For a contribution of as little as $35 per year, Members also are entitled to: free admission to the Garden, Shaw Arboretum, and Tower Grove House; invitations to special events and receptions; announcements of all lectures and classes; discounts in the Garden Gate Shop and for course fees; and the opportunity to travel, domestic and abroad, with other Members. For information, please call (314) 577-5100.

Postmaster: send address changes to Lee B. Fox, editor, BULLETIN, P.O. Box 299, St. Louis, MO 63166.

Comment

Saving the Shoreline

Those of you who have visited the Japanese Garden this spring have, no doubt, noticed a lot of construction activity in the area. A photograph of this work was featured on the cover of the last issue of the *Bulletin*.

In recent years the forces of current and wind have eaten away the lake's shoreline by as much as six feet in some places. Even the "head" of Tortoise Island has become partially submerged as the foundation has settled. Recent television accounts have shown vivid examples of severe damage to property on the Great Lakes. Temporary measures have helped us avoid severe damage, but we have discovered that a full scale restoration project now will halt the erosion permanently.

Recently, you received a letter from me asking for your help. In appreciation of your support, all donors of $100 or more will receive an exclusive reproduction of a Japanese netsuke depicting the koi, or carp, which delight both young and old visitors to the garden. The idea for the netsuke was inspired by the recent gift of a large collection of authentic netsuke from Dr. and Mrs. Alfred Fleishman. Please consider making a donation to help us complete this worthwhile project.

The Weather

Many Members have inquired about damage to the Garden's horticultural displays caused by the several recent cold snaps. I am happy to report that what damage there was has been confined to a few of the most tender perennials, such as some of the hostas. There does not appear to have been any damage to the bulbs, roses and trees.

The peonies in the Japanese Garden, the irises, azaleas, roses and daylilies all promise to put on a spectacular show again this year. Please come and enjoy your Missouri Botanical Garden.

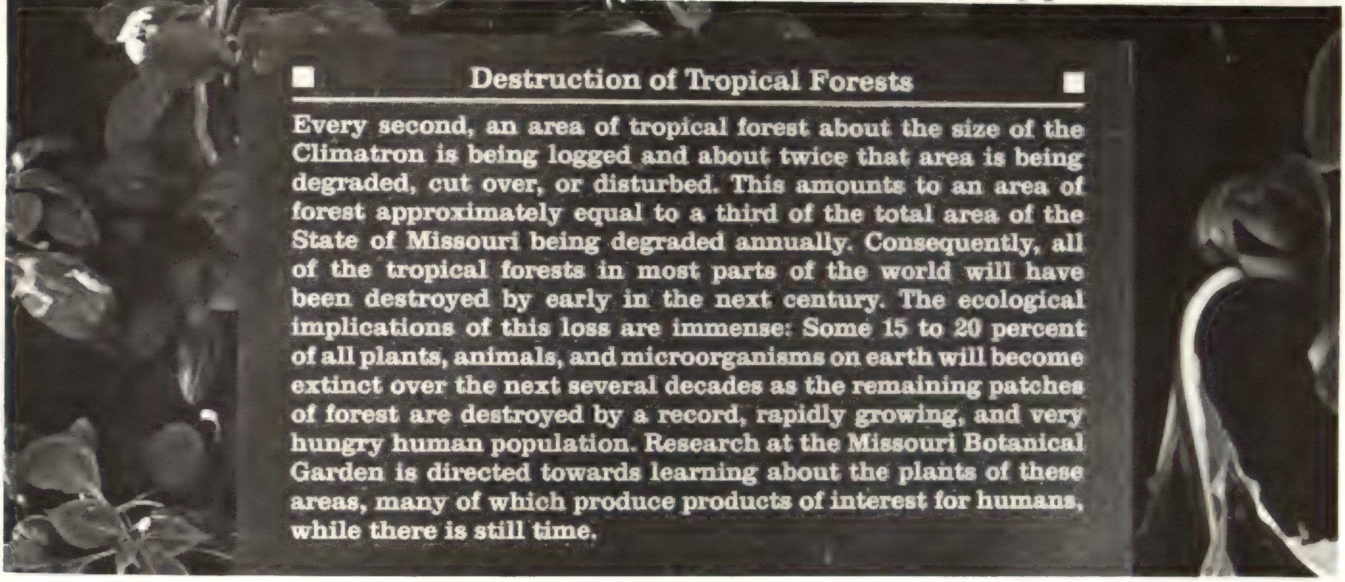
Peter H. Raven

Construction crews began work on the new production greenhouses in March by drilling large holes to support the foundation of the new structures. Work is proceeding on schedule and should be completed in about a year.

Climatron Restoration on Schedule

The architects, engineers, exhibit designers and Garden staff involved in the renovation of the Climatron have been meeting regularly to develop the plans prior to beginning construction drawings.

As part of this planning, Paul Brockmann of the Garden staff and Del Williams of Ross and Baruzzini, the mechanical engineers for the project, recently visited several greenhouses in southern California to evaluate a new type of cooling system being considered for the Climatron. The system cools by pumping water under high pressure through fine nozzles to vent an atomizing mist, which cools the surrounding air. The system has been used for years to cool livestock buildings and has been used in some greenhouse applications around the world in the past five years.


This sign greets visitors to the Climatron.

Destruction of Tropical Forests

Every second, an area of tropical forest about the size of the Climatron is being logged and about twice that area is being degraded, cut over, or disturbed. This amounts to an area of forest approximately equal to a third of the total area of the State of Missouri being degraded annually. Consequently, all of the tropical forests in most parts of the world will have been destroyed by early in the next century. The ecological implications of this loss are immense: Some 15 to 20 percent of all plants, animals, and microorganisms on earth will become extinct over the next several decades as the remaining patches of forest are destroyed by a record, rapidly growing, and very hungry human population. Research at the Missouri Botanical Garden is directed towards learning about the plants of these areas, many of which produce products of interest for humans, while there is still time.

WE'RE KILLING OUR WORLD

MISSOURI BOTANICAL
MAY 6 1987
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BY PETER H. RAVEN

On February 14, 1987, Garden Director Peter H. Raven presented the keynote address to the 153rd annual meeting of The American Association for the Advancement of Science in Chicago. The Association, with 132,000 members, is the largest scientific organization in the nation. More than 4,000 scientists attended the meeting. The following is excerpted from his remarks. For a copy of the complete text write to: "We're Killing Our World," Missouri Botanical Garden, P.O. Box 299, St. Louis, MO 63166.

EVEN THOUGH we live in a world where far more people are well fed, clothed, and housed today than ever before, we also live in a world in which up to 100,000 people starve to death every day, one in which we consume well over a third of total terrestrial photosynthetic productivity, and one in which our activities are threatening up to a quarter of the other kinds of organisms on earth with extinction in the near future. Since we base our civilization almost completely on our ability to utilize these organisms for our benefit, the loss of so many of them threatens to limit permanently the options that will be available for our children and grandchildren.

The global human population, which passed the 5 billion mark for the first time recently, and is growing at an annual rate estimated at 1.7 percent, is a dominant ecological force without precedent. Our numbers have *doubled* since 1950, and will double again in about 40 years if present trends continue. Today, we consume or divert about 40 percent of everything that all the wild and cultivated plants in the world produce—an enormous impact. At the same time, regional climatic problems are becoming increasingly apparent, another sign of wide-scale danger. How will we respond to these threats, and why should those of us who live in the relative comfort of countries such as the United States even care?

Many of our most serious problems are centered in the tropics, where biological diversity is concentrated and is being lost most rapidly and whole ecosystems are being disrupted. In the tropics, three factors are of special importance: (1) the explosive growth of record human populations; (2) widespread and extreme poverty; and (3) an ignorance of the ways in which to carry out productive agriculture and forestry. Let's look at these three factors in turn.

As recently as 1950, about 45 percent of a global population of some 2.5 billion people lived in countries that lie wholly or partly in the tropics; today, the figure is about 55 percent of a global population that is more than twice as large. If present trends continue, nearly two-thirds of the people in the world will be living in these countries (excluding China) by the year 2020. In actual numbers, the 1.1 billion people who inhabited them 36 years ago will have grown to about 5 billion people in another 34 years: a *quadrupling* of the total in 70 years! Meanwhile, the proportion of people living in industrial countries is falling drastically. For each of us living in countries like the United States in 1950, there were approximately two other people living elsewhere; by 2020, there will be five. Population structure suggests that the global population may stabilize in about a century at a level of perhaps 10 or 11 billion people. As its growth slows down, there will be increased opportunities for raising standards of living—a real reason for preserving as many kinds of organisms as possible so that they can be re-established then.

Within tropical countries, about 1 billion of the estimated 2.7 billion people live in absolute poverty; they are unable to count on adequate food, shelter, and clothing from one day to the next. Of these, 300 to 400 million people consumed less than 80 percent of United Nations' recommended standards, a diet insufficient to prevent "stunted growth and serious health risks." UNICEF estimates that about 35 million people starve to death every year in the tropics, including more than 14 million children under the age of four. This amounts to nearly 100,000 people, and 40,000 babies, every

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Slash and burn method of deforestation

No comparable rate of extinction has occurred since the dinosaurs disappeared 65 million years ago.

day. Worse, many millions of additional children exist only in a state of lethargy, their mental capacities often permanently impaired by their lack of access to adequate amounts of food.

In addition to large populations and extensive poverty, tropical countries suffer from a lack of information about how to put in place productive agriculture and forestry, and a lack of willingness to apply those facts that are known. As a result, the natural vegetation is often consumed as if it were a non-renewable resource. Many tropical soils are relatively poor, and require careful handling. In the natural ecosystems that develop on such soils, most of the nutrients, except for phosphorus and nitrogen, are held primarily in the vegetation. Cutting and burning the trees releases these nutrients to the soil, fertilizing them and allowing the temporary cultivation of crops; when the excess nutrients are exhausted, usually within a few years, the forests must be given time to recover.

Based on 1981 Food and Agriculture Organization estimates, about 2.3 million square miles of tropical evergreen forest probably exist now—about half of the original area, now a forest that is roughly three-quarters of the size of the U.S. exclusive of Alaska. In the late 1970s, at least 40,000 square miles of such forest were being cut per year. The decline in tropical forests arises in part from consumer demand in industrialized countries. We obtain much of our timber there, for example, and logging removes about 20,000 square miles of tropical forest—an area nearly the size of West Virginia—every year. Meanwhile, reforestation is proceeding very slowly in the tropics, with ten trees being cut for each one that is planted, and, in Africa, 29 being cut for each one planted. The developed-world consumption of tropical hardwoods has risen 15 times since 1950, while in-country consumption has increased only three times. In addition, the widespread and simultaneous destruction of temperate forests through acid precipitation and other forms of atmospheric pollution compounds the overall problem that we face in securing stable wood and pulp supplies for the future.

In addition, shifting cultivation and fuelwood gathering together are severely damaging an additional area of tropical, evergreen forest about equal to that which is being clear-cut. Only about 200 million people are engaged in these activities worldwide in areas of evergreen, lowland tropical forest. If they are incorporated into the economies of their respective countries, the forests they are cutting would change immediately from a non-renewable to a sustainable resource. In addition, the relentless search for fuelwood is wrecking many tropical forests; about 1.5 billion people—a third of the world population—are cutting firewood faster than it can be regrown in the areas where they get it.

Taking both clear-cutting and kinds of severe disturbance that results from shifting agriculture and firewood gathering together, the current rate of destruction of tropical, evergreen forests may be calculated at roughly 80,000 square miles per year—an area about equal to the size of the state of Kansas. At such a rate, all tropical, evergreen forests would be gone in less than 30 years, even if there were no population growth.

Since human populations are in fact growing very rapidly—at the rate of approximately 2.4 percent per year—much of the forest will clearly be gone much sooner. Moreover, the actual rates of destruction differ widely from region to region and large areas will be deforested before the end of the century.

The international debt is greatly affecting relationships between developing and industrial countries in the 1980s. In 1970, the external debt of Third World countries was about $72 billion; today, it is approximately $1 trillion. The existence of this debt clearly encourages many Third World countries to overexploit their natural resources without the creation of stable, productive alternatives: logging restrictions are eased, poor farmers are displaced to regions that will not support them on the long term, the production of foods that the people can eat (remember that on the average, a fifth of them are malnourished) is decreased in favor of the production of export crops. The associated austerity measures can throw large numbers of people out of work, thus increasing the extent of poverty in the nations involved.

The runaway destruction of the natural resources of the tropics is also fueling massive immigration into the industrialized nations of the temperate zone. For example, the U.S. Immigration and Naturalization Service apprehended 1.7 million illegal aliens at the Mexican border alone in 1986, and estimates that more than 3 million might have entered successfully. The hunger and poverty that are responsible for such immigration also underlie economic and political instability in the tropics, and frustrate our efforts to achieve our objectives in these areas.

A devastated tropical forest

Logging removes about 20,000 square miles of tropical forest—an area nearly the size of West Virginia—every year.

Another major problem concerns the effects of tropical deforestation on global climates. Such deforestation clearly contributes substantially to the amounts of carbon dioxide in the atmosphere, an issue of increasing concern. In addition, widespread deforestation is impairing the capacities of some tropical systems to recycle rainfall inland, as well demonstrated for the Amazon and possibly related to the past 20 years of drought in Africa also. Combined with the erosion and soil deterioration that accompanies deforestation, these problems are serious ones.

The most serious, long-term global problem that is resulting from deforestation, however, is the loss of a large portion of the biological diversity on earth within a few decades. Whether this process of extinction is viewed from a scientific, aesthetic, or moral standpoint, or simply as the loss of opportunities that could otherwise have been used for human benefit, it is unquestionably the one problem that will have the most lasting consequences. The extinction rates of the present are a thousand times those of the past tens of millions of years. Despite this, it is all too easy to say, "Goodbye, California condor—but so what?" There has been an unfortunate tendency for some of the media to jump on this bandwagon: it is more stimulating to give the minority (and incorrect) view that extinction presents no problem, or that everything is fine, than it is to document the extent of the problems facing us—besides, it is comforting, and more fun!

In fact, the loss of biological diversity is important to us for many reasons. For example, three species of plants—rice, wheat, and corn—supply over half of all human energy requirements; only about 150 kinds of food plants are used extensively; and only about 5,000 have ever been used. Many of these come to us from the tropics. It is estimated, however, that there may be tens of thousands of additional kinds of plants that could provide human food if their properties were fully explored and they were brought into cultivation. There are many uses for plants other than food, too; for example, oral contraceptives for many years were produced from Mexican yams; muscle relaxants used in surgery worldwide come from an Amazonian vine, used traditionally to poison darts; the cure of Hodgkin's disease came from the rosy periwinkle, a native of Madagascar; and the gene pool of corn has recently been enriched by the finding, on a small area in the mountains of Mexico, of a perennial wild relative.

Among the undiscovered or poorly known plants are doubtless many possible sources of medicines, oils, waxes, fibers, and other commodities of interest to our modern industrial society. Genetic engineering affords us additional possibilities for the transfer of genes from one kind of organism to another, even though the donor may itself be of no economic interest whatever; indeed, as our techniques become more sophisticated, we shall come to depend even more heavily on biological diversity than we do now.

How fast is extinction proceeding? If we assume that there are 3 million species of tropical organisms—a minimum estimate, we can use the distributions of the better-known groups as a guide to how many of the total species occur only in those forests that will probably be destroyed or severely damaged in the next 15 years or so. For plants, the figures would be about 120,000 of the estimated total of about 165,000 tropical species; just under half of the total of number of species in the world occur only in forests that are rapidly being destroyed. If the distribution of other groups of organisms is roughly similar to that of plants, then about 2.2 million species, or somewhat less than half the total, would be restricted to these forests. How many of these species can we reasonably expect to survive?

The formation of parks and reserves in the threatened areas would be an important element in the survival of biological diversity; but such protected areas will survive only if they exist in the context of economies that can support them—particularly ones in which the rural poor are supported. The future of such reserves will depend in large measure on the functioning of the global economy.

Where only small pockets of vegetation survive, however, the reduced populations of plants and animals in them will face an uncertain future because of increased human pressures, changed climates in the patches, and simply the difficulties of surviving when there are only a few individuals left.

One particularly significant example of an area in which large numbers of species are endangered is Madagascar, an island about twice the size of Arizona that lies about 250 miles off the east coast of Africa. Here grow about 8,500 species of plants, some 6,500 of which are found nowhere else; the Missouri Botanical Garden, with help from the W. Alton Jones Foundation of Charlottesville, Virginia, is

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Squatters' houses in a "National Forest Preserve" in Ecuador, 1976

About 35 million people starve to death every year in the tropics. This amounts to nearly 100,000 people, and 40,000 babies, every day.

conducting an active research program on these plants. Madagascar is also the only place where lemurs, one of the major groups of primates, survive and there are many other unique and restricted organisms there. All in all, the island is probably home to about five percent of the total numbers of species of plants and animals in the world, probably 80 percent of them found nowhere else.

Based on these relationships, we may assume that over a million species will become extinct during the next 15 years or soon afterwards. Western Ecuador, for example, is another region where the Garden is carrying out an active research program. Here, a region that was almost completely forested as recently as 1950 is now almost completely deforested. As extensive deforestation of this kind spreads in many other regions, we can expect the rate of extinction to average more than 100 species a day, with the rate increasing from perhaps a few species a day now to several hundred by the early years of the next century. The great majority of these species will not have been collected, and therefore will never be represented in any scientific collection, preserved, or known in any way. No comparable rate of extinction has occurred since the end of the Cretaceous Period, 65 million years ago, when the dinosaurs disappeared; and the background level of extinction is perhaps a thousandth of that we are experiencing now.

From any point of view, the situation is extremely serious. Scientifically, we are losing the opportunity to understand the nature of much of the diversity of life on earth. Aesthetically, we are losing the chance to appreciate fully the results of the process of evolution over the billions of years since life appeared on our planet. Economically, we are denying to ourselves, our children, and our grandchildren the opportunity to utilize many of the plants, animals, and microorganisms that exist now for their benefit.

A new kind of global thinking will be necessary to manage the world ecosystem properly for the enormous human populations of the future. To demonstrate this fact, simply recall that we are now using directly, foregoing, or converting about 40 percent of everything that wild and cultivated plants produce, and that our numbers are projected to double in the next 41 years. Stability everywhere is in the interests of all, yet we are doing relatively little to promote it. Sustainable agriculture and forestry systems must be developed in every country, and their development will benefit everyone. When nations are stable and self-sufficient, they can import and export products, repay debts, provide a decent standard of living for their people, improve their governments, and preserve their biological diversity. When they are unstable and dependent, they cannot afford imports and can organize exports only with difficulty, they will default on debts, cannot provide for their people, who then may emigrate in large numbers, will tend to have unsuitable and unstable governments, and will squander their biological diversity for short-term gain.

In view of the numbers of people involved, the fragility of farm lands everywhere, and the debt, we cannot hope to feed the people of the world through temperate-zone agriculture. Indeed, as pointed out by Randall Purcell of the Curry Foundation in the *Wall Street Journal* for January 23, 1987, improving the quality of agriculture in Third World countries, especially among the rural poor, would be the most effective way to enable them to have the means to accept our own exports, agricultural and otherwise.

The international debt presents a real obstacle to achieving ecological and political stability in many parts of the world. The $22 billion paid by poor, developing countries to rich, industrial countries in 1985, for example, contributed substantially to the promotion of global instability. Payments on the debt should be mitigated or suspended when necessary, or managed in such a way as to add to, rather than detract from, world stability.

International development assistance, carefully planned and targeted, is a critical factor in building global ecological stability and thus promoting global stability. In the United States, development and food aid clearly have a low priority. In fiscal 1986, Congress provided $3.9 billion in development assistance—more than 20 percent less than the preceding year—to the nearly 100 nations that depend on outside assistance to meet such basic needs as food, shelter, health care, and family-planning services. Even though we in the U.S. have the most to gain from promoting global stability, we are 12th in overall aid, including military aid, on a per capita basis. In 1985, we contributed approximately $40 per capita, which placed us 12th, behind countries such as Norway ($132 per capita), France ($69 per capita), and Australia ($47 per capita). Such an effort is clearly not in our own national interest.

Information about the plants and animals of the region and their ecological

Forest destruction, Rio Aquaria, Ecuador Amazonia

A new kind of global thinking will be necessary to manage the world ecosystem properly for the enormous human populations of the future.

relationships ought to be acquired as part of every development project. Economically valuable organisms should be sought actively and preserved. The adoption of environmental guidelines by the World Bank in September, 1986, is a very welcome step in the right direction.

The conservation of biological diversity should be a component of every development scheme. An appropriate network of parks and reserves must be created and supported internationally on a continuing basis, and steps must also be taken to preserve representative samples of groups of organisms of particular actual or potential economic and scientific interest in zoos, botanical gardens, seed banks, tissue culture centers, deep-frozen, as cloned DNA, or in any way that is appropriate.

The detailed investigation of ecosystems at certain selected localities in the tropics, should be undertaken on an urgent basis to provide a key to the functioning of the rest. The outstanding centers operated by the Smithsonian Institution at Barro Colorado Island in Panama and by the Organization for Tropical Studies at La Selva in Costa Rica, or the rich fund of information that has been developed at Serengetti in Tanzania, provide good examples of this sort of effort.

The single most important step that could be taken to preserve the remaining forests of the tropics would be to use lands that are already deforested to produce timber, pulp, beef, and other agricultural products. Virtually all of the food, timber, and fuelwood needs of the tropics could be met by the intelligent use of such lands. At the same time, intact forests could be managed carefully to produce desired products and natural areas could be set aside. Grass roots conservation movements have sprung up in many tropical countries, and should be encouraged fully.

The potential role of biotechnology in providing cheap, efficient ways to improve Third World crops, such as millet, cassava, and yams, deserves special attention. Such improved crops, combined with appropriate levels of chemical and mechanical support, as well as economic and political reform, could dramatically assist in the effort to make small farms sustainable in the tropics. Such trends as the rise in world consumption of fertilizer between 1950 and 1986 from 14 million to 131 million tons, or in tractors from 5.6 million to 23 million, simply cannot be sustained on a global basis. Taken together, however, the possibilities outlined above offer ample hope for the future, if they are taken seriously and pursued with vigor.

Another kind of innovative plan is being considered by Congress, which would convert a fraction of the funds distributed by US-AID into loans, to be administered by such agencies as UNICEF, the International Fund for Agricultural Development and the Peace Corps to help rural, poor families to become self-sufficient with small-scale health, agriculture and other projects. The individual borrowers, who must have an income of $250 per year or less, would use the money to buy fertilizer, seed, and farming tools, and the funds would be recycled in the countries to which they were provided to keep the system going. Such a plan would go a long way toward alleviating some of the serious problems outlined here.

In more general terms, an awareness of and compassion for all life, and an appreciation of the fact that we are all part of a living world that is capable, in its full development, of capturing energy, originally from the sun, and making it available for the life processes of living organisms, is the key to an orderly management of the ecosystems that support us all. We cannot avoid profoundly modifying the global biophere, and in fact have already done so; nevertheless, we should not allow ourselves to respond only when the crises that we have caused are so extensive that they threaten our lives. To do so is to be thoroughly immoral in the fullest meaning of that term.

As His Holiness Tenzin Gyatso, the Fourteenth Dalai Lama, put it in his message on World Environment Day, June 5, 1986,

"Peace and survival of life on Earth as we know it are threatened by human activities which lack a commitment to humanitarian values. Destruction of nature and natural resources results from ignorance, greed, and lack of respect for the Earth's living things. It is not difficult to forgive destruction in the past which resulted from ignorance. Today, however, we have access to more information, and it is essential that we re-examine ethically what we have inherited, what we are responsible for, and what we will pass on to coming generations.... Clearly this is a pivotal generation.... Our marvels of science and technology are matched if not outweighed by many current tragedies, including human starvation in some parts of the world, and extinction of other life forms.... We have the capibility, and the responsibility. We must act before it is too late." ■

Gardening at the Garden

Rose: The National Flower

Roses certainly rank as the most popular flower in the United States, and recently the rose was named as the national flower. The Missouri Botanical Garden has two major rose gardens, one being the Anne L. Lehmann Rose Garden and the other The Frank Y. and Katherine Graves Gladney Rose Garden.

The Lehmann Rose Garden is divided into three distinct sections. These include an old-fashioned rose terrace where older varieties and shrub-type roses are grown, and the All-American Rose Selections (AARS) Test Garden where new varieties are grown for three years and evaluated by our rosarian, Monica Colombo, as to their performance under St. Louis growing conditions. The third section features the various AARS winners along with other hybrid teas, grandifloras, multifloras and miniatures.

The Gladney Rose Garden is from an original design by John Noyes, landscape designer active at the Garden from 1914 to 1944. This garden was restored in the past few years and features the AARS winners and a selection of floribundas and hybrid teas. The arbor surrounding it displays a collection of climbers.

HYBRIDIZING

The thousands of different roses available today all trace their heritage back to the 12 dozen or so species roses, the ones that grow in the wild. The process of obtaining new roses is called hybridization. In this process, two different varieties of roses are bred together. The plants from the resulting seeds will be different from the original two.

BONICA
Everblooming Hybrid Shrub

Bees and other pollinating insects can cause this process to happen "naturally." Man can also create hybrids and has raised it to a fine art in the last 100-plus years, continually improving both flowers and plants. The overall procedure is lengthy—from crossing to introduction to the public takes seven to ten years of painstaking work.

Before the cross is made, the hybridizer selects the parent plants, taking into account color, form, hardiness, disease resistance, foliage, and so forth. Next, the outer petals of the selected parents are removed, exposing the reproductive organs. All rose flowers have both male and female parts. In the center of the flower are the female organs—pistils topped with a pollen-receiving stigma. The male organs, called stamens, surround the pistils and bear pollen-producing anthers.

To prevent self-pollination, the anthers are removed on the "mother" plants. The anthers on the "father" plant are harvested, labeled, and stored. About a day later, a sticky substance forms on the stigmas. The anthers release the less than dust-size pollen grains at about the same time, at which point it is brushed on the stigmas.

The rose is now labeled with information such as date of pollination and parentage. A bag is placed over the pollinated flower, blocking further pollination. If fertilization occurred, the area beneath the reproductive organs begins to swell. This is the hip, or fruit, of the rose. It ripens in several months, is harvested, and the seeds removed.

The seeds are then cleaned and stratified, a process in which the seeds are placed in small containers of peat moss and stored at 40°F for six weeks, before being planted. Growing in a greenhouse, the first flowers may appear within seven to eight weeks after germination, giving an indication of this new plant's potential.

A hybridizer may look over as many as a hundred thousand seedlings each year, with 99 percent discarded at some point during the first growing season. What makes this part of the job even harder than it sounds is that sometimes a promising-looking seedling will not do well when budded onto rootstock and grown outdoors. Conversely, an average-appearing plant may exhibit something special when bud-grafted and grown.

FIELD TESTING

The seedlings that pass muster are now ready for field testing and evaluation. More than just one plant is needed for this, so the original seedling is propagated. In order to have additional plants exactly like the parent, new ones are started by taking a cutting of a piece of stem that is the bud, or eye, found at the point where the leaf joins the stem. This is grafted onto a rootstock—a rooted cutting of another rose.

Grafting is necessary because many of today's complex hybrids root poorly or erratically on their own. Most of our garden roses are grown on the climbing rose 'Dr. Huey' or on a variety of multiflora roses. Buds are taken from dormant plants in late fall and grafted the following spring or summer.

It is as budded, field-grown plants that these new roses really begin to "show off." More are discarded and a few are budded in larger quantities for further testing. For at least another two to four years this process continues until only a handful remain. Some of the most promising are entered in the All-American Rose Selections judging. Four plants of each variety are sent to the 23 AARS test gardens around the country (Missouri Botanical Garden being one) for two more years of observation. Once a company is ready to introduce a variety, large quantities of plants are budded and grown to marketable age—a period of another two years.

Long and arduous, the process of hybridization is now complete. The new variety—superior in any number of ways, be it color, fragrance, foliage, hardiness, disease resistance, or whatever—is now ready to bloom and grow beautifully in yards all over the country.

THE WINNERS

Come and see what is new in roses for 1987 at the Garden. The 1987 All-America Rose Selections (AARS) winners are:

Meidomonac, also being sold under the name **Bonica**, originated in France at the House of Meilland. It is an ever-blooming shrub rose of three to five feet in height with pastel pink flowers and has small glossy green leaves. This is an exceptionally hardy rose and has performed well at the Garden. It is particularly suitable for treatment in mass planting and shows marked disease resistance. The flowers are followed by abundant orange-red, medium-sized hips that add fall and winter interest to the garden outdoors and arrangements indoors, plus they attract the birds to the garden.

New Year was hybridized by Sam McGredy IV of Auckland, New Zealand. It is a grandiflora, somewhat intermediate in character between the floribunda and hybrid tea. It has good disease resistance with leathery dark green foliage and is a strikingly different tangerine orange color. The flowers are produced in abundance on sturdy stems, making it a good cut flower.

Sheer Bliss is the third AARS winner, introduced by William A. Warriner of Jackson and Perkins. It is a hybrid tea, creamy white in flower color with a pink blush. It is a strong upright grower with glossy dark green foliage and the flowers have a pronounced sweet fragrance.

To learn more about growing and enjoying our national flower, the rose, All-America Rose Selections offers a free brochure. For your copy, send a stamped, self-addressed, 4 by 9-inch envelope to Discover the Pleasure of Roses, Route 1, Box 740, Palmyra, Indiana 47164.

—Alan P. Godlewski,
Director of Horticulture

SHEER BLISS
Hybrid Tea

NEW YEAR
Grandiflora

MAY-JUNE

DAY-BY-DAY

MAY

1-3 **Japanese Tree Peony Exhibit**
9 a.m. to 5 p.m. daily, Monsanto Hall. Entitled "A Plant for the Connoisseur," spectacular macrophotographic display (5 ft. by 3 ft. photos) of Japanese tree peonies by Sir Peter Smithers. Free. Funded in part by the Missouri Arts Council.

1-2 **Food on the Table**
A program co-sponsored by the Garden and the United Nations Association to search for a solution to world hunger. Call 721-1961 for information.

2 **Migrating Birds**
8 a.m. to 1 p.m., Sat., Shaw Arboretum. See some of the many birds returning north in the spring. $6 Members, $7 non-members.

2 **Breakfast with the Birds**
8 to 11 a.m., Sat., Ridgway Center and grounds. Early morning walk on Garden grounds in search of birds followed by a continental breakfast in the Gardenview Restaurant, $8 Members, $10 non-members.

2-31 **Biblical Plants Exhibit**
10 a.m. to 4:30 p.m. daily, Mediterranean House. Special display highlighting many of the plants found in the Mediterranean region that have biblical significance. Free.

3-9 **Salute to The Garden**
Famous-Barr's downtown store will showcase the Garden with week-long events. Watch your mail for details.

3 **Walking Tour**
2 p.m., Sun., Ridgway Center and grounds. Tour of grounds and greenhouses by Garden Guides emphasizing what is in bloom and especially worth seeing at this time of year. Free. Call 577-5140 for reservations.

3 **Afternoon Wildflower Walk**
1 to 4:30 p.m., Sun., Shaw Arboretum. Informal walk to view a dazzling display of nature. $4.50 Members, $5.50 non-members.

5 **Spring Wildflower Walks**
9:30 a.m. to 1:30 p.m., Tues., Shaw Arboretum. Informal education walks led by expert wildflower naturalists. $1 Members, $2 non-members.

5 **Inside Tower Grove House**
7 to 9 p.m. daily, Tower Grove House, (first of two sessions). Explore Henry Shaw's historic country home and discover how the upper middle class lived in the 1800s. $18 Members, $22 non-members.

6 **Native Missouri Tree Walk**
6:30 to 8 p.m., Wed., Ridgway Center and grounds. Walking tour to identify some of the best native trees with an emphasis on spring bloomers and landscape possibilities. $3 Members, $4 non-members.

8 **Nocturnal Awareness Hike**
8 to 10:30 p.m., Fri., Shaw Arboretum. Walk in the moonlight and listen to the animals, amphibians, birds and insects of the night. $4.50 Members, $5.50 non-members.

9 **Greater St. Louis Iris Society Show**
Noon to 5 p.m., Sat., Ridgway Center. Exhibit featuring a wide array of beautiful iris. Free.

9 **Clams on The Halfshell**
10 a.m. to 2 p.m., Sat., Shaw Arboretum. A look at the naiades of Missouri streams. $4.50 Members, $5.50 non-members.

9 **English Woodland Garden Nature Album**
9:30 a.m. to noon, Sat., Ridgway Center. Family activity that will teach the history and natural history of the English Woodland Garden by creating an album of sketches, paintings, poetry and pressed plants, Members $5 adults, $3 children; non-members $6 adults, $4 children.

9 **Basket Making**
9 a.m. to 3 p.m., Sat., Shaw Arboretum. Learn the art of basket weaving to create your own egg basket. $22 Members, $24 non-members.

9 **Wildflower Identification**
10 a.m. to noon, Sat., Ridgway Center and grounds. Learn to identify several Missouri wildflowers via slides, identification guides and a walk. $18 Members, $22 non-members.

9-31 **Carnivorous Plant Exhibit**
9 a.m. to 5 p.m. daily (10 a.m. to 7:30 p.m. beginning May 23), Ridgway Center. Exotic display of "meat-eating" or insect-eating plants. Free.

10 **Mother's Day**
The perfect time to treat Mom to a tour of Garden grounds in spring, lunch in the Gardenview Restaurant, and a box of candy or a gift item from the Garden Gate Shop.

12 **Spring Wildflower Walk**
Please see May 5 for details.

13 **Evening Walk in the Japanese Garden**
6:30 to 8:30 p.m., Wed., Ridgway Center and grounds. Enjoy the serene beauty of Seiwa-En in spring while learning the symbolism of the garden. $6 Members, $8 non-members.

14 **Evening Walk in the Japanese Garden**
Please see May 13.

15 **Nocturnal Awareness Hike**
Please see May 8 for details.

16 **Wildflower Collecting Trip**

8 a.m. to 4 p.m., Sat., Ridgway Center. Take an excursion to Perryville with a botanist to see how specimens are collected for scientific use. $25 Members, $30 non-members.

16-17 **Horticulture Society Show**

Noon to 5 p.m. on Sat. and 9 a.m. to 5 p.m. on Sun., Ridgway Center. All encompassing display of many flowers and vegetables in season as well as perennials and house plants. Free.

19 **Spring Wildflower Walk**

Please see May 5 for details.

20 **Garden Design Walk**

6:30 to 8 p.m., Wed., Ridgway Center and grounds. Proper design can make your garden more enjoyable. Learn the secrets by observing nine of Missouri Botanical Garden's gardens. $3 Members, $4 non-members.

23 **Summer Hours Begin**

Daily Garden hours expand to 9 a.m. to 8 p.m. (were 9 a.m. to 5 p.m.), effective through Labor Day (Sept. 7).

23-24 **Rose Society Show**

Noon to 8 p.m. Sat. and 9 a.m. to 8 p.m. Sun., Ridgway Center. Exhibit featuring lots of cut roses. Free.

26 **Spring Wildflower Walk**

Please see May 5 for details.

27 **Fountains, Pools and Sculpture Walks**

6:30 to 8 p.m., Wed., Ridgway Center and grounds. Tour featuring the works of marble, bronze, water and steel that embellish the Garden grounds. $3 Members, $4 non-members.

29 **Purple Martin Evening**

6:30 p.m., Fri., Shoenberg Auditorium and grounds. Movie, lecture and discussion on the popular bird that consumes up to 2,000 mosquitoes each day. Free. Cash bar available.

30 **The Nature of Insects**

9 a.m. to 3 p.m., Sat., Shaw Arboretum. Workshop on insects covering their evolution, classification, life cycles, behavior and feeding patterns. $6 Members, $7 non-members.

JUNE

3 **Music Fest**

7:30 p.m., Wed., Spoehrer Plaza. Kick off for popular annual concert series, starring the *St. Louis Ragtimers*, $2 at the door. *See back cover for details.*

4 **The Garden Library**

1:30 p.m., Thurs., Shoenberg Auditorium. Slide show and lecture about the history and collections of the library. Free.

4-5 **Members' Rose Evening**

4 to 8 p.m. Thurs. and Fri., Rose Gardens. Enjoy dinner and a stroll through the Gladney and Lehmann Rose Gardens sponsored by Famous-Barr. Watch your mail for details.

5 **Nocturnal Awareness Hike**

Please see May 8 for details.

7 **Walking Tour**

Please see May 3 for details.

9 **Summer Rose Care**

10 a.m. to noon, Tues., Ridgway Center and grounds. Learn when and how to water, fertilize and mulch. $10 Members, $12 non-members.

10 **Music Fest**

7:30 p.m., Wed., Spoehrer Plaza. Second of four concerts, starring the *Bosman Twins*, $2 at the door.

12 **Nocturnal Awareness Hike**

Please see May 8 for details.

13 **Trees of the Arboretum**

10 a.m. to 3 p.m., Sat., Shaw Arboretum. Learn to identify trees by leaf and bark characteristics, and learn about their typical habitat. $6 Members and $7 non-members.

14 **Lehmann Building Open House**

1 to 3 p.m., Sat., Lehmann Building. Get a behind-the-scenes look at the Garden's newly renovated research labs, herbarium and library. For Members Only. Free.

17 **Music Fest**

7:30 p.m., Wed., Spoehrer Plaza. Third of four concerts, starring the *Laclede String Quartet*. $2 at the door.

17-30 **Gardens and Castles of Scotland**

A special tour of the many public and private gardens of Scotland, led by Alan Godlewski. Call 726-2577 for information.

21 **First Day of Summer, and Father's Day**

Prime time to visit the Garden with so much in bloom, including the roses.

24 **Music Fest**

7:30 p.m., Wed., Spoehrer Plaza. Last of four concerts, starring *Lenny Klinger & Galaxy*, $2 at the door.

27-28 **Daylily Society Show**

Noon to 8 p.m. Sat. and 9 a.m. to 8 p.m. Sun., Ridgway Center. Annual display of the popular daylily. Free.

Ask the Answer Service

Help for Peonies

Do you have a plant question? Call the Horticultural Answer Service, Monday through Saturday, 9 a.m. to noon, at ***577-5143.***

Q. How do you control ants on peonies? They're eating the flower beds on my plants.

A. The ants aren't eating your peony flowers. They are feeding on the sweet syrupy material secreted by the developing buds. They do no harm and won't be such a nuisance once the flowers open.

Q. What happens to my peony flowers? The past three years the plant grows well, but the buds turn black and dry up before they even open.

A. Sounds like your peonies have a fungus disease known as *Botrytis* blight. The fungus overwinters in the dead stalks, so sanitation is the first step in control. Cut and destroy all infected parts. In the fall remove all dead leaves and stalks down to the soil line. Spray the plants in the spring with a fungicide such as Benlate once a week beginning when the shoots start to grow and continue until the plants bloom.

Q. I need to move my tulip bulbs but they still have their leaves. Can I move them without their being damaged?

A. Just dig them up carefully and leave as much soil on the roots as possible. Heel them in in a place where they are shaded during the hottest part of the day. Keep them well watered until the foliage ripens and dies. Tulips can then be dug up, dried out, cleaned off and stored in net sacks in a cool place until planting. Tulips are best replanted in the fall between mid-October and mid-November.

Q. Last year the edges on all the leaves of my redbud turned brown and dried up. Now I see where the bark is peeling off in places. Is my tree going to die?

A. These two conditions may not even be related. Last summer we had a long, hot dry spell often accompanied by winds during which the leaves of many trees "scorched"—redbuds included. Peeling bark on a redbud is natural and should be expected, particularly on older trees. Provided the tree has leafed out fully and is growing vigorously, there is no need for concern. Keep your redbud vigorous by regular watering, especially during dry spells and fertilizing at least every other year or so.

Q. What do seed companies mean when they refer to an F_1 Hybrid?

A. F_1 Hybrids are plants that have been produced by crossing selected male and female parents known by plant breeders to produce offspring that inherit qualities of each parent. These offspring are the F_1 (first generation) Hybrid.

Q. I bought a lovely "China Doll" in the Garden Gate Shop. How do I take care of it?

A. "China Doll" or *Radermachera sinica* is a relatively new houseplant with highly attractive, glossy green compound leaves that droop gracefully. They require bright indirect light and will tolerate full sun with protection from the hottest sun of the day. Keep the humidity up and don't let the soil dry out between waterings. They prefer a well-drained potting mix high in organic matter. Fertilize every other week from spring to fall. Prune as needed to maintain a good shape and propagate from ripe wood cuttings in July.

Q. I was in the supermarket recently and found a large piece of culinary ginger that had sprouted. I bought it and planted it but want to know how to grow it.

A. Grow culinary ginger (*Zingiber officinale*) in bright light but shaded from strong sunlight. A soil mix consisting of two parts loam, one part peat moss, one part sand and ½ part dried cow manure works well. Set the fleshy root (actually an underground stem) so it is barely covered by soil. Keep the soil moist but not soggy. Feed well-established plants monthly with a balanced houseplant fertilizer. They prefer warm temperatures (70-80°F) and high humidity. The leaves die down in the fall, so gradually reduce watering and keep somewhat dry until new growth begins in the spring. Propagate by dividing in the spring.

Q. Can you give me information on growing basil? I'm interested in trying some of the new scented varieties.

A. Sow basil outdoors after all chance of frost is past. Thin plants to stand 12 inches apart. Pinching the tops when the plants are five to six inches high will encourage bushy growth. Seeds sown in pots in August or September can be grown indoors in winter "windowsill" gardens. Basils are very versatile, having a place in vegetable, herb and fragrance gardens.

The Garden Gate Shop carries two excellent collections from Shepherd Seed Co. The Scented Basil collection contains Lettuce-Leaf, Purple (Opal), Lemon, Cinnamon and Anise selections, each with its own unique fragrance. The Italian Basil collection contains four additional selections, including the outstanding "piccolo" basil. A highly ornamental plant with tiny light green leaves, its compact bushy habit makes it well suited to flower and edible borders.

Hardy Kiwi Update: Stark Brothers Nursery of Louisiana, Missouri, has introduced a new superior cultivar 'Issai' (pronounced eh-sigh). Self-pollinating, thereby eliminating the need for planting both male and female plants, 'Issai' will set fruit in its second year of growth. The future has arrived on the Hardy Kiwi frontier.

—Chip Tynan, The Answer Service

Don't miss Chip on the KXOK Garden Show (AM 630) each Saturday from 8-9 a.m.

Volunteer Profile

MARY WIESE

When a Garden Member, after viewing the film on tropical rain forests asked, with tears in her eyes, "What can I do to save the forests?" it was reward enough to Mary Wiese, senior Garden Guide, for the countless hours spent preparing the film shown January 18, in conjunction with the Members' Day tour of the Climatron.

Using slides from the files of Dr. Alwyn Gentry, curator of tropical botany, and from the World Wildlife Fund, Mary narrated a 20 minute film on the rapid, tragic destruction of these forests.

Mary has been a Garden Guide since 1974 and has been an invaluable resource in the training and enrichment of other Garden Guides, both new and experienced. Her knowledge comes from reading and personal experience. She first became enchanted by the forests during a trip to the Lacandone "Jungle" in southern Mexico 20 years ago. Since then she has visited rain forests world wide from New Guinea to Zimbabwe, with five trips to South America. She also led a trip to Trinidad for the National Audubon Society.

Mary does not confine her interest to one field. She is an avid bird watcher and conducts classes on birding each year. She frequently gives bird walks at the Garden and has one listed in the Spring Courses and Lecture brochure entitled "Breakfast With the Birds" on May 2. The Webster-Kirkwood Times recently published an article about her experiences with mushrooms.

Besides Audubon she is an active member of the Webster Groves Nature Study Society, the Nature Conservancy and the World Wildlife Fund. Several years ago Mary helped the WWF preserve a rain forest (La Planada) in Colombia and collected enough funds to buy about 600 acres.

NEWS FROM SHAW ARBORETUM

Prairie Seed Collection and Processing

Prairie seed processing at the Arboretum being done by Joyce Davit (center), and volunteers Jim Klott (left) and Warren Haberman.

In order to achieve a good distribution of wildflowers and grasses throughout the Experimental Prairie and increase its size, large quantities of seed are required. Most of the wildflower seed is collected at the Arboretum from plants grown in the greenhouse and transplanted to the Experimental Prairie during the past six years. To be viable, seed must not be collected until it is fully mature.

In November and December the seeds are removed from their pods or seedheads and, in some cases, screens of various sizes are used to remove chaff and stalks. Some seeds, mostly the legumes, have a very hard seed coat and must be scarified using sandpaper to promote germination. Prior to planting, the seeds are stratified by moistening and storing them in plastic bags in a refrigerator for two months.

While seed collection and processing are laborious, it is very satisfying work because you are in close contact with the products of nature and gain intimate knowledge of the plants and their seeds. Many species have beautiful seeds, especially when viewed with a dissecting microscope. Many have a wonderful smell and a few, such as Hairy Mountain Mint, are powerful enough to clear one's sinuses. Much of the seed collecting and processing is done with the help of volunteers.

In 1986 the Experimental Prairie was expanded from 68 acres to 74 acres. A six acre tract just north of Mirror Lake was plowed last fall and was planted this spring. These new plantings are exciting to watch because the results are so variable and the changes in plant populations are very great during the first two or three years. This variability is due to the germination success of the seeds which were planted, the kinds of seeds already existing in the soil, and the weather following planting.

For Members interested in growing prairie grasses and wildflowers, small packets of seeds of selected species are available for purchase in the Visitor Center at Shaw Arboretum. In general, prairie plants are drought-resistant perennials and require maximum sun.

—William Davit

FROM THE MEMBERSHIP OFFICE

In Your Travels...

Don't forget one of your most delightful membership benefits is a chance to visit other botanical gardens and arboreta throughout the country. If you're planning your summer travel itinerary, be sure to include these other gems around the country:

- Massachusetts Horticultural Society, Boston
- Blithewold Gardens and Arboretum, Bristol, Rhode Island
- Hershey Gardens, Hershey, Pennsylvania
- Chicago Botanic Garden, Chicago
- Dallas Arboretum and Botanical Society, Dallas
- Morris Arboretum, Philadelphia
- New York Botanical Garden, Bronx, New York
- The Royal Botanical Garden, Hamilton, Ontario, Canada
- Botanica, The Wichita Gardens, Wichita, Kansas

At all of these fine gardens and arboreta, you will be given free admission and receive special treatment as a member of the Missouri Botanical Garden. Likewise, we will welcome members from all these institutions to St. Louis as our guests!

Upcoming Dates To Remember

Purple Martin Evening *Thursday, May 28, 6:30 p.m.*
Don't miss this annual favorite. A chance to learn about the ever popular Purple Martin. A lecture in Shoenberg Auditorium followed by a stroll through the Garden to visit the Purple Martins. Cash bar available.

Rose Evenings *June 4 and 5*
Last year's Rose Evening was so popular and fun that it has now blossomed into a two-evening affair. Watch your mail for your reservation form for this lovely opportunity to have dinner among the roses. Sponsored by Famous-Barr.

Lehmann Building Open House *June 14, 12-2 p.m.*
Take this opportunity to visit the newly renovated home of the Garden's research program, the Lehmann Building. A real behind-the-scenes experience!

Tower Grove House Auxiliary Names New President

The Tower Grove House Auxiliary has elected Virginia Blume as its new president. She joined the auxiliary shortly after its inception in 1977, and has been a volunteer tour guide in the house for 12 years.

The auxiliary was formed to help promote Tower Grove House and assist with special events and fundraising efforts. Tower Grove House was Garden founder Henry Shaw's country home. Built in 1859, restoration efforts began in 1953 enabling the house to open its doors for public tours in 1954.

Current responsibilities for the auxiliary include coordinating the house's tea room functions, with all funds raised used for additional refurbishing of the historic structure. The auxiliary also sponsors the house's annual events, the Fall Craft Sale and Holiday Candlelight Tour. The auxiliary makes an annual $1,500 donation to the Garden's unrestricted fund.

Gift Memberships

Any day of the year can be Mother's Day (May 10) or Father's Day (June 21) at the Garden. A visit to the Garden is special, fun and memorable. This year give your mother or father a gift membership to the Garden and let them enjoy their "day" all year long. Just use the application below or call 577-5118.

GIFT MEMBERSHIP ORDER FORM — *Please mail at least three weeks prior to occasion:*

☐ *Birthday* ☐ *Mother's Day* ☐ *Father's Day* ☐ *Other* ____________________

Gift To:

NAME ____________________
ADDRESS ____________________
CITY ____________ STATE ______ ZIP ______
TELEPHONE ____________________
Sign gift card: ____________________
Date Needed By: ____________________
Regular Membership $35. Contributing Membership $75.

For more information call 577-5118.

Gift From:

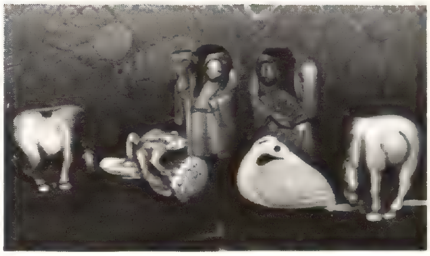
NAME ____________________
ADDRESS ____________________
CITY ____________ STATE ______ ZIP ______
TELEPHONE ____________________
☐ Enclosed is my check for $ ____________
☐ Please charge: VISA No. ____________
MasterCard No. ____________
Name as it appears on card: ____________
Expiration date: ____________

Please make checks payable to: Membership Office, Missouri Botanical Garden, P.O. Box 299, St. Louis, MO 63166.

Garden Receives Japanese Netsuke Collection

The netsuke are coming! A collection of these delicate Japanese carvings has already arrived at the Garden, but the netsuke are not yet on exhibit for Garden visitors to admire. Expect to see the collection, a gift from Dr. and Mrs. Alfred Fleishman, in the Garden Room of the Ridgway Center during this year's Japanese Festival, August 29 through September 7.

Exactly what is a netsuke (pronounced "Net-ski"), anyway, you may be wondering. These Japanese miniatures of animals, people, objects in Japanese everyday life and even abstract designs were used to fasten small pouches or cases to the obi or sashes on Japanese kimonos. More Japanese men than women wore them. In use as early as the fourteenth century, they are small, generally an inch or two long, and rarely exceed three inches. According to *Netsuke: A Guide for Collectors*, a book also donated by the Fleishmans, they have two characteristic holes in the top or back to allow a cord to pass through. Most of all, the tiny objects are delightful. Antique netsuke have fascinated Western collectors since the late nineteenth century. They have gradually risen in value as fewer and fewer have been produced and Japanese men have turned to Western dress. Netsuke carving is by now practically a lost art.



Thanks to Dr. and Mrs. Fleishman, visitors to this year's festival will have a chance to view these marvels of perfectionist carving. The Fleishman collection includes many examples of outstanding quality such as: a horse standing on a small base, head extended downward as if he is eating grass; a frog climbing the stalk of a flower; two rabbits nestling in a basket; a smiling man riding a water buffalo; and an ivory swan with ruby-red eyes arching a graceful neck. These are all examples of the type of netsuke known as katabori—a name which means "figure carving." More katabori exist than any other type of netsuke, and their rich variety, intricacy, realism, and humor make them natural favorites of collectors and visitors to museums.

Among this group are several trick netsuke. A cheerful kabuki actor strikes a pose. If you finger his tiny features, a new face revolves into place, frowning this time. Another small male figure stares straight ahead. But when he tips forward, his eyes pop out in a surprise. The collection also includes some fine specimens of manju, or flat netsuke. The name manju literally means "bun" or "cake."These ivory discs are covered with intricate ornamental carving.

So inspired were Garden staffers by the new Fleishman collection that they have commissioned a reproduction netsuke. In the shape of—what else—the koi or carp familiar to Japanese Garden visitors. The reproduction will be presented to anyone who donates $100 or more to the campaign to restore the shoreline of the Japanese lake. Scheduled for completion in time for the Japanese Festival, this essential work will ensure the carp a happy home along the shoreline and under the bridges of Seiwa-En.

Whether you come to the Japanese Garden to admire the real carp or take home a reproduction of a netsuke carp, be sure to visit the Fleishman netsuke collection at the Japanese Festival this year. These intriguing figurines offer an unusual perspective on Japanese life and culture. That's what the Japanese Festival and the Japanese Garden are all about.

From the Garden Gate Shop *Book Reviews*

101 Townhouse Garden Designs

Here is an interesting little book by Joel J. Lerner (HP Books, $7.95) which certainly has merit in the St. Louis urban area. It covers a myriad of garden layouts for the less than spacious plots of land that are typically found in the urban backyard. The book includes helpful checklists to guide you in a self-analysis of your garden needs and can help you devise an interesting design for your home.

—Alan P. Godlewski

The Well-Furnished Garden

One of the most beautiful and inviting books being released this spring, *The Well-Furnished Garden* (Simon & Schuster, $24.95), is a gold mine of information on the use of ornamental items in landscaping. Since garden design entails so much more than plants, it is refreshing to find a book that focuses on the other details of design, such as walks, fences, sculpture and fountains. The 600 photographs and drawings, many in full color, make this a perfect coffee table book, as well as a practical and informative guide to garden ornamentation.

Whether you wish to dream away on a rainy day or get practical advice on landscaping, *The Well-Furnished Garden* will be a pleasant addition to your gardening library.

—Sharon Wilson Baebler

Mother's Day/May 10

Visit the Garden Gate Shop to select the perfect gift for Mother's Day. The Gift Shop is featuring the exclusive silk scarf, designed especially for the Garden with Missouri wildflowers in either blue or green, to Members at a special price of $25.00 until Mother's Day, May 10.

Other gift suggestions include potpourri, handbags, fashion jewelry, or porcelain figurines. As always, Gift Certificates are available.

Blooming plants with colorful baskets or decorative pots make ideal selections. If your Mother is an avid gardener, stop in the plant department for the perfect outdoor gifts and tools.

Father's Day/June 21

Remember Father on his day with a special gift from the fine assortment available in the Garden Gate Shop. Selections include an array of flower and vegetable gardening books, wind chimes, sun dials and distinctive gardening tools. Dad may also like a Gift Certificate so he can come at his convenience to select something of his choice. The Shop is open from 9:00 a.m. until 8:00 p.m. Memorial Day weekend through Labor Day.

For Younger Members

Investigating Insects

One step. That's all it takes to transport yourself magically into a world teeming with strange and exotic wildlife. Just go to your back door and take one step into the miniature jungle of your backyard. There lurking in the dense forest of bushes and garden vines lies the interesting world of insects.

Insects are creatures with very unique habits. How many other animals do you know that wear their skeletons on the outside of their bodies? Insects do! Insects have also been around 100 million years longer than humans. With a history that long, they deserve some respect. Unfortunately we humans often have the misconception that insects are pests. This could not be farther from the truth. To date, scientists have named and recorded over three-quarters of a million insects. More than 95 percent of these are completely harmless to humans.

In fact, insects are very helpful to man. Our ecosystem depends on insects to aid in pollinating plants. Insects are the chief pollinators of many plants. They carry pollen from flower to flower. This causes the flowers to produce seeds and reproduce. Some flowers produce fruits that we like to eat. It is with the help of insects that we can savor the taste of apples, oranges, and even watermelon.

Insects also provide us with important commercial products. It is because of insects that we can enjoy honey on our morning toast. Insects also provide the shellac that we use on furniture, the wax for candles and the silk for special clothes. Insects have even been known to provide medicine to treat people with diseases. The study of insects is becoming increasingly important as scientists learn more about heredity, evolution and biochemistry.

You can study insects and learn more about their miniature world by taking an insect safari in your backyard. You don't need any special equipment except an observant set of eyes and a pair of listening ears. One insect you will want to investigate is the ant. You may find an ant wandering along a sidewalk. It will wander aimlessly back and forth, searching for food. Sometimes it looks like it may be lost. But an ant never has to worry about finding its way home. As ants roam they secrete a substance called formic acid. This leaves a scented trail. When the ant is ready to return to the ant colony, it uses its antennae to smell its way home.

A honey bee is a familiar insect, but if you watch it closely, you may learn something new. A honey bee knows how to 'dance.' On cool evenings, honey bees use their wings to keep warm. They vibrate their wings very rapidly in order to increase their body temperature. They also 'dance' to communicate distance and direction of food sources.

Crickets are unique individuals whose ears are on their legs. Below the knee of a cricket is an oval opening that lets it hear. A female cricket can hear the male crickets call from a distance of 30 feet. Can you imagine what it would be like to have your ears below your knees?

As you are watching the insects on your safari, think about how an insect walks. What would you do if you had six legs? Would you first move the whole right side and then the whole left side? You might tip over if you tried that. Instead, an insect moves the first and the last leg on one side and the middle leg on the other side in unison. That way, it never becomes unbalanced.

PROJECT

Collecting Critters

The study of insects is called *entomology.* Part of entomology is the capture and collection of insects. This can be a very interesting hobby. The equipment you will need is inexpensive and you can make most of it.

Kill Bottle

1. Select a wide mouth pint jar with a screw lid.
2. Soak cotton balls in rubbing alcohol and make a layer ½ inch to ¾ inch deep in the bottom of the jar. (Rubbing alcohol is not as toxic as carbon tetrachloride and is recommended for use by children, but does not kill insects quickly and therefore should not be used for large winged insects.)
3. Cover the cotton with a piece of cardboard cut to fit just inside the jar. Cover the jar with a tight lid.

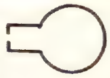
Collecting Net

You will need:

1. A handle about three feet long; a broom handle will work.
2. About five feet of stiff wire, such as a wire coat hanger, for the hoop.
3. A piece of unbleached muslin or nylon about 3 x 5 feet for a net bag.

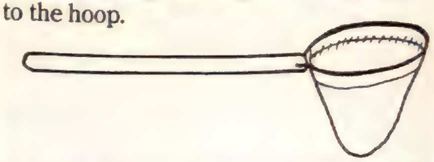
What to do:

1. Bend the wire into a hoop about 12 to 15 inches in diameter. Bend the ends as shown.



2. Drill a hole in the end of the handle so the wire will fit into them.

3. Sew netting into bag shape and attach to the hoop.

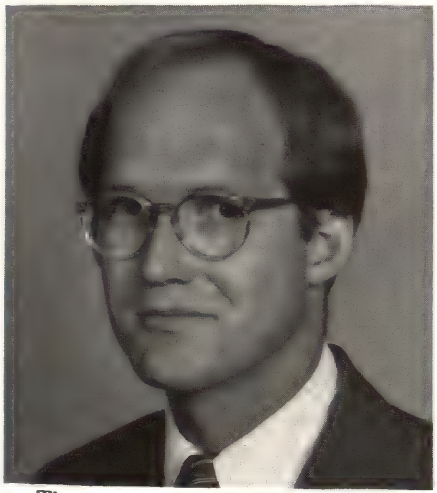


After collecting your insects you will want to identify and display them. You may display your insects on pins inside a cigar box. Be sure to use an insect guide to correctly identify your specimens. Your local library can help you locate some good resources.

—Stephanie Finke,
—Youth Education Coordinator

Trustee Profile

DAVID W. KEMPER



The newest member to the Garden's Board of Trustees, and at 36, the youngest person to be so honored, is David W. Kemper, president and chief executive officer of Commerce Bancshares Inc.

A relative newcomer to the St. Louis area, Kemper was quite familiar with the Garden from his home in Kansas City. "St. Louis was always known for its first-class cultural institutions, and the Garden is at the top of the list," Kemper said.

"There is talk of establishing a botanical garden in the Kansas City area," he said. "Peter Raven came to speak to a group there and told us how the Garden has worked to gain the support of the primary and secondary schools as one method of building a base of support for the future."

Kemper also said he was very interested in the Garden's research efforts in tropical botany. "I once worked in the international division at Morgan Guaranty, and I could see the problems in the Third World that Dr. Raven talks about."

Besides his role as president of the bank holding company, he is also Chairman of Commerce Bank-St. Louis and a board member of the Businessmen's Assurance Co. and the Federal Reserve Bank of St. Louis. Kemper is also on the board of directors of the St. Louis Area Council of the Boy Scouts of America, the Arts and Education Council and the St. Louis Symphony, and is a member of the Young Presidents Organization. He resides in Ladue with his wife, Dotty, and three children.

Plant Talk From the Gardenview Restaurant

Tomatoes

FOOD FACTS:

Tomatoes have not always been appreciated! This may seem silly to most of us today who use tomatoes, fresh in salads, and cooked in sauces on pizza, pasta and of course catsup. Tomatoes are the third most popular fresh vegetable after potatoes and peas. The garden tomato and its many varieties are of the species *Lycopersicon lycopersicum* in the deadly nightshade family (Solanaceae). Early in their history in cultivation, tomatoes were regarded as interesting to look at but evil to eat. All early tomatoes were yellow in color, not the red ones we eat today, and were grouped as the "mala insana" or bad egg, and lumped with other poisonous plants that were never intended for cooking.

The then evil tomato was a native to Central and South America, and was first found growing wild as a weed by early Incas in corn and bean fields. The weedy relative of the modern tomato was probably the cherry tomato, *Lycopersicon cerasiforme*, which grows wild in Peru and Ecuador. Modern tomatoes (cultivars) are descended from tropical species through a succession of hybridizations and selections for taste, color, texture, juice, pulp and market life.

Although the most popular tomatoes, Burpee's Big Boy, Burpeeana Early, Beefsteak, Manulucie, Rutgers, Tropic, Valiant, Ramapo, Fireball, Jester, Presto, Small Fry, Tiny Tim, Red Cherry, and Yellow Plum, are grown in the United States and Latin American home gardens for local consumption. U.S. types are now grown for mechanical harvesting by special machines in Florida, California and Texas where the plant is grown over large areas, harvested and shipped to the North. In Europe the same popular varieties are grown on a large scale in greenhouses.

Tomato researchers use some of the most sophisticated techniques to grow the plant in a variety of world environments. The crop grows well in the tropics but in high humidity areas is prone to fungal and bacterial diseases and root knot nematode disease. Tomato breeders in the United States are now developing disease-resistant cultivars for growth in Latin America.

Tomatoes are annuals or short-lived perennials, with weak, trailing, much-bunched stems. They have glistening reddish-yellow glandular hairs (trichomes) and pointed non-glandular hairs that help prevent desiccation. The glandular hairs emit an organic substance that gives the tomato its particular fragrance, impeding some insect predators.

Tomatoes can be started from seed, in nursery beds, on a windowsill or in the popular seed starter kits. They are easy to grow. Even though they take up a lot of room when they grow, they don't have to. They can be squeezed in almost anyplace in the garden, up against a wall or fence, among your flowers, or even in a patio tub or balcony container. Few other vegetables can be treated with as much neglect as this one and still yield a satisfactory harvest.

—Ken Laser, Education Department

FOOD TIPS:

Mary Cassetti's Double-Zapped Tomato Shells

½ pound pasta shells
2 tablespoons unsalted butter
3 sun-dried tomatoes, cut into thin slivers
1 large fresh tomato, peeled, seeded and diced
3 tablespoons plain yogurt
2 tablespoons freshly grated Parmesan cheese
Salt and freshly ground pepper

1. Cook the shells in boiling water until tender, 3 minutes for fresh pasta, longer for packaged. Drain.
2. Melt the butter in a medium saucepan over low heat. Stir in the pasta, dried tomatoes, fresh tomato, yogurt, and Parmesan cheese. Add salt and pepper to taste. Serve at once.

Serves 4 as a first course.

Kids' Tip:

Did you know that American Indians claimed a cut ripe tomato to be an unbeatable room deodorant? They used the juice of the tomato, high in acid, to rub on their skin to remove the scent of garlic, wild onion, a hard day's work, skunk and other noxious odors.

Garden Director Peter Raven gave an address on the subject of biological diversity at a conference sponsored by the European Community in Dublin, Ireland, in March. Pictured above with Raven (far right) are (from left to right) Peter Day of Cambridge, England, who spoke about the preservation of the diversity of crop plants, Prime Minister Garret FitzGerald of Ireland, and Marie l'Hermitte of Dijon, France, who spoke about a new code of ethics for protecting biological diversity. Raven was the only American to speak at the conference.

Salute to the Garden

During the week of May 3-9 Famous-Barr will showcase a "Salute to the Garden." The activities will take place at Famous's downtown store and will include week-long activities with a Garden theme. Floral designers from the area will be giving demonstrations, columnists will be speaking, and the Master Gardeners will be giving advice. Floral designs on the first floor of the store will reflect many of the different gardens on the grounds. Members who attend on opening day, Sunday, May 3, will be eligible for a drawing for a trip to the Chelsea Flower Show. Look for your invitation to all the activities in the mall.

Research Grant Supports Work in Costa Rica

A $20,000 research grant for the Garden's 1987 William L. Brown Postdoctoral Fellowship has been awarded by Pioneer Hi-Bred International, Inc. to Garden botanist Dr. Michael H. Grayum. Grayum is presently stationed in Costa Rica doing botanical research in conjunction with the Museo Nacional de Costa Rica and the Field Museum, Chicago.

"Costa Rica is an important source of knowledge for understanding the diverse and significant flora of Central America," said Garden Director of Research Dr. Enrique Forero. "The long-term goal of the Garden's participation in Costa Rica—with the help of funding by Pioneer Hi-Bred for the Brown Fellowship—is the production of a much-needed Spanish-language manual describing that country's flora."

Brown, who received The Henry Shaw Medal in November, is well respected in the scientific and agricultural communities. Before retiring in 1984, he spent 39 years at Pioneer Hi-Bred and made significant contributions as plant scientist, research director, administrator and author.

Past Brown Fellows and their fieldwork locations are James C. Solomon in Bolivia and Gordon D. McPherson in New Caledonia.

Tributes JANUARY - FEBRUARY 1987

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Mrs. Carl Glaser, Jr.
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Mr. and Mrs. Bert Schweizer II

Mrs. Nora Stern
Mrs. Andrea Schankman

continued on next page

Tributes

continued

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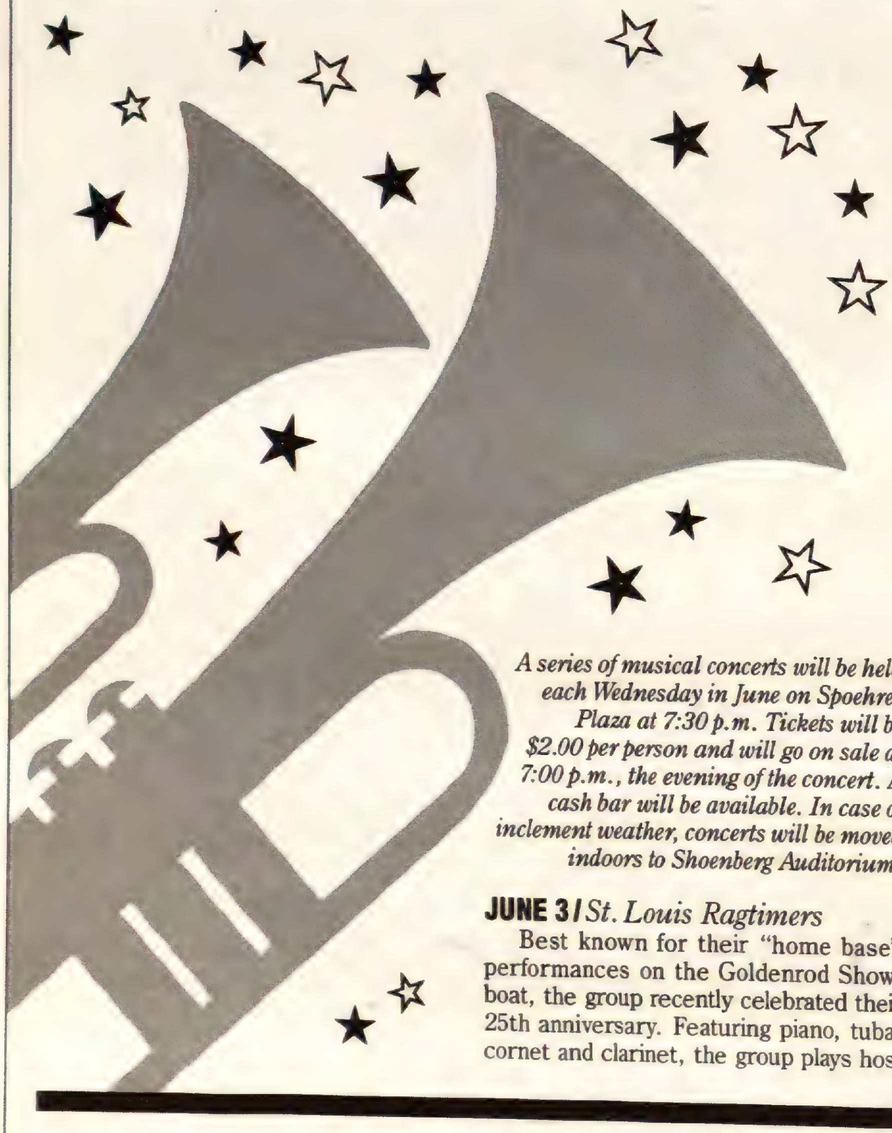
Music Fest Returns for Third Season



A series of musical concerts will be held each Wednesday in June on Spoehrer Plaza at 7:30 p.m. Tickets will be $2.00 per person and will go on sale at 7:00 p.m., the evening of the concert. A cash bar will be available. In case of inclement weather, concerts will be moved indoors to Shoenberg Auditorium.

JUNE 3 / *St. Louis Ragtimers*

Best known for their "home base" performances on the Goldenrod Showboat, the group recently celebrated their 25th anniversary. Featuring piano, tuba, cornet and clarinet, the group plays host to the annual Ragtime Festival on the Riverfront and Laclede's Landing. They have appeared on NBC's Today Show and travel across the country delighting audiences with their "toe tapping" ragtime sounds.

JUNE 10 / *The Bosman Twins*

Twin brothers, Dwight and Dwayne, have led this group in becoming one of St. Louis' most talented and well-known jazz groups. Playing to standing room crowds around the area, they offer the best in favorite jazz and popular tunes. The brothers on saxophone, flute, clarinet, cornet, lead guitar and drums will bring you a performance you will long remember.

JUNE 17 / *Laclede String Quartet*

This group combines the sounds of two violins, viola and cello to provide the optimum in a full, luscious, smooth sound that never overpowers. From Mozart to Michael Jackson, with lots of stops along the way for Cole Porter, Scott Joplin and great ballroom music, they are sure to become one of your favorite musical groups.

JUNE 24 / *Lenny Klinger & Galaxy*

St. Louis contemporary and pop music fans know this group as one of the area's best. A favorite with both young and old, they perform many favorite '60s and current tunes. Their performance is sure to be upbeat and entertaining.

MISSOURI BOTANICAL GARDEN BULLETIN (ISSN-0026-6507)
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The BULLETIN is sent to every Member of the Garden as one of the benefits of membership. For a contribution of as little as $35 per year, Members also are entitled to free admission to the Garden, Shaw Arboretum, and Tower Grove House; invitations to special events and receptions; announcements of all lectures and classes; discounts in the Garden Gate Shop and for course fees; and the opportunity to travel, domestic and abroad, with other Members. For information, please call (314) 577-5100.

Postmaster: send address changes to Lee B. Fox, editor, BULLETIN, P.O. Box 299, St. Louis, MO 63166

The line drawings of Missouri plants are from Spring Flora of Missouri by Julian A. Steyermark, first published by the Garden in 1940.

FROM THE PRESIDENT

The Missouri Botanical Garden enjoys an unusually close and cordial relationship with people in the St. Louis metropolitan area. This is no accident. Our programs in education and horticultural display and our outreach into the community are part of an overall plan designed to provide service of exceptional quality and thereby earn the friendship of all who visit the Garden.

During 1986, this brought record numbers of visitors, increased enrollment in our education programs and the highest level of membership in the Garden's history. Membership jumped 12 percent over the previous year, bringing the membership rolls to an impressive 18,490 at year end. The Garden continues to be the broadest-based membership institution in the St. Louis area. Also, more than 50,000 hours of volunteer work were completed during 1986 by 530 trained volunteers.

General attendance, too, showed a dramatic increase with over 650,000 visitors attending flower shows, films, lectures, concerts, special events, or simply enjoying the beauty of the Garden. Attendance at private events alone reached 38,000 this past year. More than 71,000 attended the 11th Annual Japanese Festival in August, making this an event of continuing importance to St. Louis and the region.

Education programs not only attracted record numbers of adults and children to the Garden, but also served the community at other locations as well. Educational outreach programs reached almost 4,000 senior citizens through the Soule Senior Center. The Speakers' Bureau provided lecturers for more than 40 neighborhood, community and business groups and the Horticultural Answer Service offered free advice on gardening and lawn care to more than 20,000 telephone callers.

The Garden's botanical research program continued to grow and gain stature in the world community. The John S. Lehmann Building was renovated to increase storage space for our herbarium specimens and add needed offices and systems. Scientists from all over the world came to St. Louis during 1986 to study and consult at the Missouri Botanical Garden. The Garden hosted the Second International Legume Conference that brought researchers and teachers from a dozen countries and every state in the Union. Additionally, Garden scientists visited other countries to work in the field, to provide training and to exchange ideas with other scientists.

Our director, Peter Raven, observed his fifteenth anniversary at the Garden last year. Peter, who has changed the face of the Garden and improved it in every area, was honored by individuals, organizations and even nations in 1986 for his outstanding leadership, knowledge and ability. Among his awards last year was the Hutchinson Medal from the Chicago Horticultural Society and, perhaps most impressive, he was awarded the International Prize for Biology by the Emperor of Japan.

The Garden presented honors as well to very deserving individuals in 1986. Roger Tory Peterson, one of America's best-known artists, naturalists and explorers, was presented the Garden's Greensfelder Award in March. William L. Brown, retired chairman of Pioneer Hi-Bred Seed Company, renowned scientist, and a former Research Fellow at the Garden, was the recipient of the Henry Shaw Medal in November.

During 1986, the generous financial support of the people of St. Louis City and County, through the Botanical Garden Subdistrict, our Members, public and private foundations and individuals allowed the Missouri Botanical Garden to expand its efforts to serve the community.

I am extremely proud to have had the privilege of serving as President of the Board of Trustees during this year of accomplishment and growth. I look forward with great optimism to the years ahead.

John H. Biggs

John H. Biggs
President, Board of Trustees

MISSOURI BOTANICAL
JUL 28 1987
GARDEN LIBRARY

FROM THE DIRECTOR

This report on our activities for 1986 has a special meaning for me and my family. I came to the Garden 15 years ago from Stanford University to become Director of an institution that was known and respected around the world.

It was a formidable place and my seven predecessors had made important contributions in a number of different areas.

I felt then that the Garden had unlimited potential, in part because of what it offers and in part because of the city in which it is located. Everything that has happened since has confirmed my early optimism.

The Garden today is a wonderful, appealing place to visit. But it still has enormous potential for growth and for contributing to science and education, development of our community and the enrichment of our city.

We took great strides forward in 1986. Several new gardens within the Garden were created. The new Jenkins Daylily Garden was built last year and recently planted to display the wide variety of daylilies appropriate for St. Louis gardens. By the time you receive this report, this garden should be presenting its first floral display. In the historic section of the Garden, the Jenny Latzer Kaeser Memorial Maze has been installed. This feature is similar in concept to a Victorian maze garden that Henry Shaw once had built in Tower Grove Park. The maze illustrates garden design from a bygone era and should be an entertaining addition for both children and adults.

The Samuels Bulb Garden, which is featured on the cover of this report, put on a sensational show of color recently as did the new Azalea-Rhododendron Garden. In a continuing program, the English Woodland Garden was expanded on the northern edge. When completed, it will feature the wildflowers of Missouri.

The Garden hosted the International Waterlily Society during 1986, giving us an opportunity to promote not only the Garden but the St. Louis area as well.

Other improvements were made in areas not quite as obvious. A grant from the Institute of Museum Services enabled the Garden to continue its important tree conservation program. Most of the large, old trees at the Garden had not been treated and protected from lightning. Additionally, a new boiler was installed to ensure appropriate heating sources for major Garden conservatories.

The Garden's botanical research program had a very successful year. Renovation was completed on the John S. Lehmann Building, allowing for more efficient use of our research facilities. Dr. Enrique Forero, a highly regarded scientist from Colombia, was appointed Director of Research. More than 100,000 numbered plant specimens were added to the Garden's herbarium, and an important collection of natural history works, the Ewan Library, was brought to St. Louis and the Garden.

The research program continued to forge important alliances both at home and abroad. The Garden made arrangements to work cooperatively with the State of Missouri to revise and update Dr. Julian Steyermark's manual on the plants of Missouri. Garden scientists worked cooperatively with botanical gardens and universities all over the world. Almost 55,000 plant specimens were sent from the Garden to other institutions as gifts or exchanges. Another 48,000 were sent on loan.

More than 350 scientists were drawn to the Garden for the 33rd Annual Systematics Symposium focusing on species diversity and more than 230 persons from more than 25 countries came to St. Louis for the Second International Legume Conference co-sponsored by the Missouri Botanical Garden and the Royal Botanic Gardens, Kew, England.

The value of the Garden's research efforts were recognized through many grants and contracts. Perhaps, the most notable was the awarding of a contract by the National Cancer Institute for Garden scientists to collect plants in remote areas of the tropics. These plants will be analyzed for possible cancer curing properties.

During 1986, the Garden's education department expanded the numbers and types of programs offered to the public, to educational institutions, and to teachers. A renewed effort focused on teacher training through workshops, conferences and enhanced facilities in the Stupp Teacher Resource Center. The Garden began a three year Summer Institute in Environmental Science funded by the National Science Foundation. The summer institute gives teachers a first-hand opportunity to improve instruction and develop classroom projects. Teachers are awarded graduate credits through the University of Missouri at St. Louis.

The newest education program at the Garden, which was developed this past year, is the Henry Shaw Academy. The Academy programs are designed for youngsters, ages 7 through 13, who are interested in science, ecology and natural history. All of the initial 135 class openings were filled immediately. Additional activities for teenagers, ages 14 through 18, were started when an Explorer Post was founded at the Garden this past fall.

The Garden continued to search for ways in which we could educate and entertain the community. A full calendar of special events was presented, ranging from exhibits of fine art, photography, native crafts and our sensational flower shows to lectures, films and concerts. The biggest single event of the year, the Japanese Festival, almost didn't happen when we lost our major sponsor. Thanks to the generosity of the Fannie May Candies Foundation, the festival was rescued and more successful than ever, drawing an incredible 71,000 participants during its ten day run.

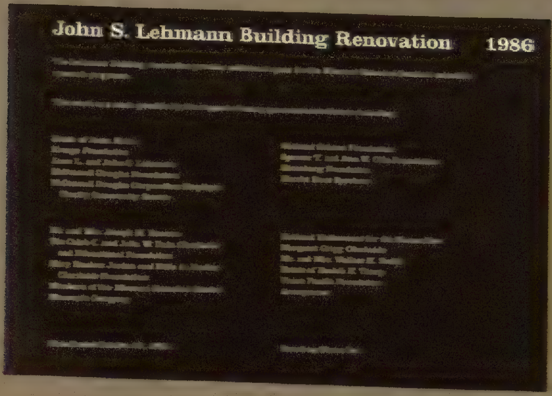
The Missouri Botanical Garden is strengthened by the community's involvement in our programs, just as the community is enriched by the Garden's offerings. The excellence and high quality of the Garden's program, whether in horticulture, research, education or special events, have sparked the interest of the national media. Stories in the New York Times, USA Today, the Chicago Tribune and others have focused attention not only on the Missouri Botanical Garden, but also on the St. Louis community as well.

None of our accomplishments in 1986 would have been possible without the hard work, devotion, commitment and financial support of the membership, Board of Trustees, Members' Board, volunteers, staff and the St. Louis community. I want to thank them all for making 1986 a success.

Peter H Raven

Dr. Peter H. Raven
Director

RESEARCH



John S. Lehmann Building Renovation 1986

The highlight of the year for the Garden's research program was the rededication, on October 23, of the John S. Lehmann Building. The $2.3 million project consisted of increasing the storage space for our herbarium collection and the library, improving the heating and cooling system in the building, adding offices and special facilities for our computers, and generally reorganizing the equipment and spaces in the building to greatly improve efficiency and potential productivity of the work space.

On the lower level, where most of the collections are housed, offices have been reconfigured and added, rooms for the computer and printers have been built, and new work areas for data input operators installed. On the middle level (previously the education wing), the auditorium was completely gutted, a second floor added, and two large specimen storage systems, called compactors, installed. The cost of the compactors was provided in part through a grant from the National Science Foundation. Work counters were added along walls of both levels, and a dumb-waiter connects the levels for ease of moving specimens up and down. A room for shipping specimens was built, and research offices and work carrels have been constructed. These improvements provide storage space for about 1.2 million additional specimens. The bryological collection and staff moved to the Administration Building, and renovation began there to provide better space for them.

Dr. Enrique Forero was appointed Director of Research in October. Dr. Forero has been a professor at the Universidad Nacional, Bogotá, Colombia, and was the president of the organizing committee for the IV Latin American Botanical Congress held in Medellín in June-July. Dr. Forero's accomplishments in the field of botany and his intimate knowledge of botany in Latin America will be important assets to the Garden's research program. I was appointed Director of Botanical Information Resources after having served as Director of Research since 1977. My responsibilities now include the library, computerized data bases, and publications as well as continuing as head of bryology.

Porter P. Lowry II was appointed Assistant Curator, after finishing his Ph.D. degree at Washington University this summer. Dr. Lowry will coordinate the Garden's research and exploration programs in Madagascar.

The Research Division lost a distinguished and beloved long-time staff member with the death of Viktor Muhlenbach, Emeritus Curator of Botany, at the age of 87 in March.

In 1986 the herbarium acquired 73,309 specimens through purchases, gifts, and exchanges, and an estimated 30,000 through staff collections. This year 54,642 specimens were sent to other institutions as gifts or exchanges, and 48,019 specimens were sent on loan.

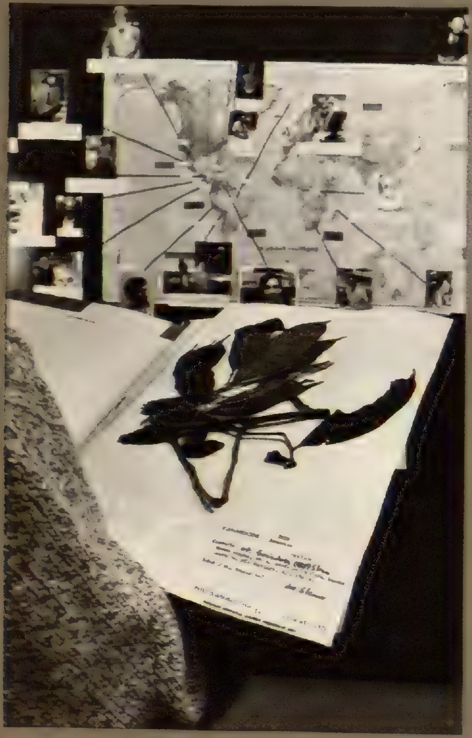
The Second International Legume Conference was held at the Missouri Botanical Garden, sponsored jointly by the Garden and the Royal Botanic Gardens, Kew, in June. The 230 conference participants represented more than 25 countries, covering interests in many aspects of Legume biology. Dr. James Zarucchi was the local conference coordinator.

The 33rd Annual Systematics Symposium was held in October, with the central theme of "species diversity." More than 350 people attended, including representatives from at least 10 foreign countries and from most states of the Union. The Symposium was coordinated by Dr. Gerrit Davidse, who has been in charge of this event for the past 15 years.

Members of the Garden's research staff also attended important scientific meetings elsewhere in 1986. The Garden had the largest U.S. delegation attending the IV Latin American Botanical Congress in Medellín, Colombia, in June-July, with eight of our research staff present. It was perhaps the largest foreign delegation from a single institution. Dr. Peter Raven and Dr. Alwyn Gentry were featured as All-Congress Speakers. After the congress several staff members remained in Colombia to do field and herbarium work.

Drs. Raven, Forero, and van der Werff attended the Symposium on Tropical Botany at the University of Utrecht, Netherlands. Raven and Forero were among the invited speakers. The Symposium took place in late September and early October, Dr. Gerrit Davidse presented a paper on seed dispersal of grasses at the International Symposium on Grass Systematics and Evolution in July in Washington, D.C.

RESEARCH *continued*



The research facilities at the Garden are used by scientists from around the world. Botanists who visited the herbarium for long periods during the year were: Dr. Mary Kalin Arroyo (Chile), Dr. Ahsan Vahidy (Pakistan), Dr. Youji Shigenobu (Japan), Ms. Patricia Gómez (Ecuador), Mr. Alvaro Cogollo (Colombia), Ms. Rosaura Grether and Mr. Oswaldo Téllez (Mexico); Mr. Pablo Sánchez (Costa Rica), Mr. Walter Palacios (Ecuador), He Si and Se Yong-Ge (People's Republic of China), Kåre and Birgitta Bremer (Sweden), and Takuji Hoshino (Japan).

Dr. Julian Steyermark was honored in the 1986 Guinness Book of World Records as a "champion plant collector." He has now made more than 138,000 numbered collections.

The National Cancer Institute awarded the Garden a contract of $650,000 to provide plants from Africa and Madagascar to be screened for agents that could treat cancer. Garden staff will collect the plants and send them to Bethesda, Maryland, where they will be extracted and tested in the lab against human cancer cells. Garden staff will also provide identifications of the plants, store vouchers in the herbarium, and recollect plants that test positive in the lab. Work will begin in Cameroon under the leadership of Dr. Duncan Thomas, our resident botanist in that country. Additional collections will be obtained in the Central African Republic by J. Michael Fay, one of our graduate students. The team in charge of the field work under this contract also includes Mr. Jon Lovett, staff member stationed in Tanzania, and Porter P. Lowry for Madagascar.

Grants from the National Science Foundation were received to continue research on Bignoniaceae, Araceae, and in Bolivia, and Mesoamerica. A grant was received from the Noyes Foundation to support work on the Flora of Antioquia, Colombia, and the Mellon Foundation awarded a grant to support study of the flora of Peru.

Black-Eyed Susan
(Rudbeckia hirta L.)

Library

The Garden library was very pleased to add to its collection the 4,500 volumes on natural history of Joseph Ewan of Tulane University. Professor Ewan and his wife, Nesta, accompanied this valuable collection to St. Louis, where they will continue their research and writing.

The recataloging project continued under a grant from Pew Memorial Trust. The goal of this project is to recatalog the library collections into the Library of Congress classification system and to place the information into OCLC, an international automated data base containing records of holdings for more than 6,000 libraries. A joint grant with The New York Botanical Garden Library was received to continue the project in 1987. The target date for completion is December 31, 1989. In addition to the 1,189 titles recataloged, 521 previously cataloged titles were placed into OCLC, and 1,469 new titles were cataloged.

A grant proposal to rebind or fully restore 135 books was funded by the National Endowment for the Arts. In-house work for the grant has been completed by the library conservator, and 108 volumes from Curtis's Botanical Magazine currently are being rebound through an outside conservator. In total, 70 books were restored, 122 rebound, and 1,782 otherwise treated (repaired, boxed, cleaned and oiled, etc.).

Renovation of the circulation and archives areas, along with changes in the cataloging, reference, and conservation areas, was completed, providing greater efficiency and an improved work area.

Among important additions to the archives were the Minutes of the Proceedings of the Tower Grove Park Commissioners, 1944-68, Japanese Garden Archives, T. Croat's Herbarium Management Papers, the Director's Office files 1911-1956 (Moore, Anderson), the Director's Office files 1956-65 (Went), and E. H. Wilson Photographs of his expedition to Japan, 1914. The archives were used to answer 230 reference questions, with 66 percent originating from Garden staff and 34 percent originating outside the Garden.

M. R. Crosby

Dr. Marshall R. Crosby
Director of Research

EDUCATION

The Education department tries to help everyone understand the importance, the glory, and the indispensable role of plants and the natural environment. Our mission transcends the Garden's venerable walls, and takes us into viritually every part of the St. Louis area.

There is a special urgency to everything we do because no matter how often we devise new programs or approaches to instruction, there is an increasing demand for more and better information. Our performance has brought international recognition.

During 1986 the education department received numerous grants from national, regional, local and individual sources, and provided quality education to 89,133 youth and adults in metropolitan St. Louis.

The department's 12 full-time and five half-time staff, five student interns and 185 volunteers conducted courses and programs in horticulture, gardening, botany, natural history, arts/crafts, and environmental sciences.

The department featured several programs for the public that were specifically designed for students and their parents and teachers. An Endangered Species Day was held in conjunction with the Missouri Department of Conservation. This full day conference was open to the public and featured specialists who focused on regional and local plant and animal species that are recognized as endangered. The Spring Lecture Series held in April presented The Great Rivers of the World: Mississippi, Amazon, Ganges and Nile, and offered the audience a tour of the history, people, geography and ecology of these rivers from first hand experiences of local travelers. A major highlight in July was a joint presentation with the St. Louis Science Center on career opportunities in biogenetic engineering. Students, parents and teachers received first hand information on this career field from a scientist in the field, saw a display of the biological basis and future on biogenetic technology and toured a Monsanto Company research facility in West County.

The year saw the department participating in several other activities for local teachers at all grade levels, addressing the local and national need for improving the quality of science instruction. The department again joined the St. Louis Science Center in making a presentation in Washington, D.C. on how science is taught in the St. Louis Public Schools.

Our own teacher training efforts emphasized a need by local teachers to enhance their classroom instruction. Last summer, 30 local teachers participated in the first Summer Institute in Environmental Science funded by a three year grant from the National Science Foundation. The institute gave teachers a first hand opportunity to improve their instruction in concepts of ecology, energy, natural history and environmental science through guest speakers, Garden staff and visits to resource sites such as Labadie Power Plant, Cahokia Mounds, Rockwoods Reservation, the Meramec River and Shaw Arboretum.

Also, several workshops for the Suitcase Science materials, ECO-ACT concepts and the Earth Education Program at Shaw Arboretum provided ways to significantly improve local classroom instruction via the Garden.

Missouri Botanical Garden, like other cultural resource agencies across the nation, continues to provide local schools with instructional programs to supplement their existing curricula. A permanent city school staff member is housed at the Garden and actively involved in correlating the Garden's offerings with the St. Louis Public School's new science curriculum. This individual also is responsible for classes in the Pairing and Sharing Program, revising numerous classes for the Garden's youth programs, and working closely with volunteer instructors/guides in their training sessions.

Activity in the Stupp Teacher Resource Center was highlighted by the addition of an Apple IIe computer and several software programs for use by teachers, the Garden's staff and volunteers. A brochure describing the goals, schedule and holdings of the Center was sent to 2,100 teachers, librarians and school principals. This yielded a growing interest and response to the facility and in establishing it as a center for assisting teachers.

Grants from various national, regional, and local agencies as well as individuals, allowed the department to operate many of its programs and to develop others. These grants included: the St. Louis Board of Education — Magnet, Partnership, Pairing and Sharing and ECO-ACT Programs; Joyce Foundation — ECO-ACT and Suitcase Science Program development, teacher training and the annual Science Symposium for teachers; the Norman J. Stupp Foundation — development and implementation of the Teacher Resource Center; the Pitzman Fund — to continue the 29th year of programs in nature study/natural history; the Samuel D. Soule programs for senior citizens; National Science Teachers Association — Chautauqua teacher training program in ecology/environmental science; the Sycamore Tree Trust and private individuals — ECO-ACT program in student leadership in the City and County schools; and the National Science Foundation for conducting the Summer Institute in environmental science for teachers.

Programs with the St. Louis city and county public, private and parochial schools drew 48,273 children to utilize the facilities at both the Garden and Shaw Arboretum. The Magnet School Program from Stix and Mason schools came to classes on a regular basis to explore the Garden's collections. The education staff and volunteers offered hands-on activities in botany, horticulture and ecology which provided stimulating ways for students to integrate classroom knowledge with practical applications. The 1986 school year was a successful one for the Partnership Program. A variety of classes and topics were offered to students. Programs offered did emphasize a special city — county integration project providing a successful way for students to interact with each other at the Garden.

The 14 Suitcase Science Programs continued to increase in their popularity with teachers and educators. These materials are available to teachers through the Stupp Teacher Resource Center to check out and use in their classrooms. They cover such topics as Mammals of Missouri, Prairies of Missouri, Seeds, and Reasons for Seasons. Each program provides supplies, props, teaching aids, background information and follow-up activities for children from kindergarten through the eighth grade.

ECO-ACT, the exemplary science program in high school student leadership, continued its active training of students and elementary teachers, both at the garden and Shaw Arboretum, in fundamentals of ecology and environmental science. The program has students from 17 area

EDUCATION *continued*

high schools teaching environmental science in 39 elementary classrooms in City and County schools.

Other community outreach efforts resulting from the combined forces of the education staff and volunteers included the Partnership staff assisting Ron Yaros, KTVI meteorologist, as he visited the Garden regularly in the Shoenberg Auditorium to present his "For Spacious Skies" program to students followed by a guided tour of the Garden to study the relationship between plants and the weather through the science of meteorology. In addition, a "Day of the Rose" was a program offered in conjunction with faculty and students at Meramec Community College to explore the influence of the rose on our culture through the years. Several staff members continue to be involved in local gardening and beautification efforts through the Gateway to Gardening Association and the 27th Ward project in the City of St. Louis. Staff also continued to actively participate in Botany Field Days, the St. Louis Post-Dispatch Home Gardening Fair, the Parenting Fair, the St. Louis Career Fair and numerous off-site workshops.

The Henry Shaw Academy and Explorer Post were the newest programs to be offered in the Education Department. The Academy is designed for children, ages 7-13, interested in science, ecology and natural history. To date, the Academy has 135 members. Through structured classes in science, special events and projects, the Academy provides opportunities for these young people to develop a better understanding of the natural world and to improve their skills in outdoor exploration and scientific investigation. Numerous activities for youth, ages 14-18, began in the fall of 1986 when an Explorer Post was founded at the Garden. They have been actively organizing outdoors activities and planning ways to pursue their career interests at the Garden.

The Arboretum education staff has had an eventful year with class offerings and tours for children from both the city and county schools. The Earthkeeper program, in its second year, provided an opportunity for students to spend a few hours or a two and one-half day overnight in the "Earthkeeper" program, created by the Institute for Earth Education, and included a variety of outdoor, science enrichment and environmental education experiences. Altogether 41,426 people visited Shaw Arboretum last year.

Other activities at the Arboretum in 1986 included the installation of a new foot bridge across a portion of Pinetum Lake, planting 33.5 pounds of seeds in the 68 acre experimental prairie, establishing a 20 acre demonstration plot of native grasses for hay and pasture, and preliminary work on a 1.5 acre Missouri wildflower area near the Visitor Center.

Adult education at both the Garden and Shaw Arboretum provided experiences in a variety of areas of horticulture, gardening, botany, arts/crafts, photography, and natural history. The department continued to offer a course with the Missouri Historical Society in the life and times of Henry Shaw, Tower Grove House and Tower Grove Park. In addition, the department offered courses in horticulture and gardening in West County, made possible through St. Louis Community College — Clarkson Center.

As part of Adult Education, the Samuel D. Soule Center for Senior Citizens offered seasonal programs to 4,360 individuals in 118 groups in the St. Louis metropolitan area with hands-on programs at the Garden or slide presentations in senior adult residences or facilities. This popular program is available to any senior citizen in the area and is made available by the generous donations of the family and friends of the late Dr. Samuel D. Soule. His personal goal for this program was to offer quality programs for today's increasing population of active senior adults utilizing plant material and having access to the Garden year round. The Garden is deeply indebted to his forethought in serving the senior citizens of St. Louis and he will be deeply missed by all of us.

Henry Shaw's country residence, Tower Grove House, welcomed 24,913 visitors last year from all 50 states and over 50 foreign countries. The Tower Grove House Auxiliary observed its tenth anniversary in 1986.

The Auxiliary, with the help of the St. Louis Herb Society, the Members' Board, the St. Louis Garden Club, the Ladue Garden Club, Farm Trails Garden Club, Village Garden Club, Four Winds Garden Club and a Girl Scout Brownie Troop, decorated the house for the holidays. Over 200 people attended the Candlelight tour on December 10, and 3,371 toured the house in December.

Our educational efforts for all audiences were only made possible by the 185 volunteers represented by five groups — volunteer instructors and guides, Master Gardeners, Horticultural Answer Service, Speakers Bureau and greenhouse volunteers — in the department. They continued to serve as an active line between the Garden and general public. All groups underwent intensive training by the Garden staff and guest speakers for enrichment.

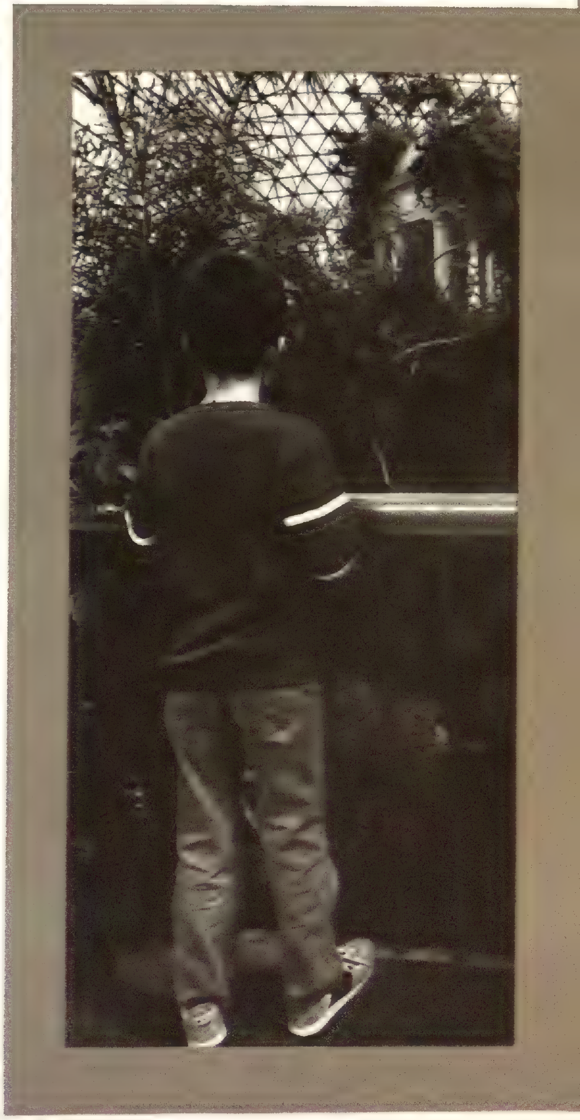
The Education greenhouse volunteers were responsible for preparing several thousand plants for school children, families and adults and in renovating the greenhouse cold-frames for expanding their holdings. The volunteer instructors continued to teach the numerous school children that pass through our doors, receiving enrichment instruction in content and process skills to reach this wide audience. Their utilization of all facets of the Stupp Teacher Resource Center enabled them to incorporate the latest audio-visual and computer programs in their teaching. The volunteer guides, conducted tours for 13,252 children and adults during 1986, with 77 percent of these 18 years and under. The guides continued to conduct tours of the Garden's collection and also the varied art exhibits and floral display shows.

The Horticulture Answer Service, dedicated to serving the public by telephone, answered 21,254 calls about horticulture, gardening, landscaping, house plant and lawn concerns and mailed out 2,233 plant care sheets. The Horticulture Answer Service was selected as the Volunteer Organization of the Year in St. Louis and 17 of its members were honored for ten or more years of active service. The Horticulture Answer Service began to write regular *Bulletin* articles, a weekly question/answer column in the St. Louis Post-Dispatch and host a gardening show on KXOX radio. The Master Gardeners continued their training under the Missouri Cooperative Extension Service. They also provided public slide presentations of the Garden's collections and special Garden programs in the areas of botany, horticulture and gardening and provided many speakers for the Soule Senior Citizens Program.

The Speakers Bureau presented 137 speaking engagements to an audience of 4,235 people in the metropolitan St. Louis area. This group of volunteers gave their talks to school, church, civic, and senior citizen groups on a variety of topics related to the Garden's collections, plants of the Bible, and gardens of the world.

Kenneth D. Laser

Dr. Kenneth D. Laser
Chairman of Education



DISPLAY

The Garden offers the visitor a treat in every season. Indoor and outdoor display features create a continuing pattern of variety and delight that changes in each month. The year began with an outstanding orchid show in Orthwein Floral Hall set among the ruins of a Spanish-style mission. Monsanto Hall was graced with a companion exhibit of botanical illustrations by the world-renowned Margaret Mee. Ms. Mee accompanied her "Flowers Of The Amazon," to the pleasure of all who met her.

The backwoods of Pucky Huddle were the setting for the spring flower show. The elaborate display, complete with grist mill and a myriad of flowers, prepared us for the outdoor spring, which proved to be one of the loveliest in years. The spring flower show was accompanied by an exciting exhibit entitled "Birds In Art." The exhibit from Leigh Yawkey Woodson Gallery was sponsored in part by the Missouri Arts Council. It featured such well-known artists as Robert Bateman, Roger Tory Peterson, and J. Fenwich Lansdowne.

A selected color pallet of bronze and gold and muted reds, ushered in the fall flower show. The classical display was set in an Italian-inspired garden. The companion exhibit in Monsanto Hall featured 500 years of botanical art from the Missouri Botanical Garden's own collection, and the stunningly realistic wildflower sculpture of Neal Deaton.

The season ended with a splendid holiday exhibit featuring a Swiss chalet artfully surrounded by poinsettias and holiday plants. Monsanto Hall exhibited holiday trees depicting Scandinavia, England, Holland, France, Germany and Italy that had been designed by local florists. We thank Citicorp Person-to-Person, Inc. for its sponsorship of the holiday displays.

Two additional plant exhibits were mounted indoors this past year. Monsanto Hall was the setting for a popular carnivorous plant display. During the period of the annual

Henry Shaw Cactus Society show, there was a fine presentation of Haworthias, a group of African succulents.

On the Garden grounds, expansions, additions and enhancements were the rule for the year. An ongoing effort in memory of Edward G. Cherbonnier by his family, continued the expansion of the English Woodland Garden to the north. When completed it will feature many Missouri woodland flowers.

An exciting new Maze Garden was begun just southeast of Tower Grove House. It is a traditional maze in keeping with those designed in Victorian England. It features an intricate layout of yew hedges and American arborvitae. When completed it will have a central gazebo covered in white roses and white clematis. The new garden was made possible through a bequest from Mrs. Jennie Latzer Kaeser and a gift from Mr. and Mrs. Vernon W. Piper. It will be dedicated as the Jennie Latzer Kaeser Memorial Maze.

The new Jenkins Daylily Garden was set just south of the Goodman Iris Garden. This feature highlights the marvelous Asiatic genus that has proven a fine garden subject for St. Louis. Both species and modern hybrids will be shown in this garden, ultimately making a superb summer feature. It was constructed in memory of G. Stuart Jenkins by his wife Ada Jenkins Kling.

Two exciting additions of sculpture were also added to the Garden. The Bell Tree Sculpture, given by Mrs. Isabel Zimmerman, was installed in the Scented Garden this past fall. It has enhanced the area by adding the sense of sound to the other sensual pleasures found there. The sculpture was a collaborative effort by William C. Severson, sculptor at Scopia in Chesterfield, and Desmond Gross, St. Louis sculptor. The bronze bells were designed by artist Paolo Soleri.

The second gift of sculpture will premiere in 1987. It is the "Grande Biagneuse, No. 3" called "The Bather" by Emilio Greco, a prominent Italian sculptor. The work is figurative, depicting a woman bather, and will be installed in a pool on the south side of the Linnean House. The "Grand Biagneuse, No. 3" is a gift from Patricia Aloe Tucker.

A great deal of work not seen by the public was completed this past year. The Garden was host to a meeting of the International Waterlily Society, and we marked the occasion by installing an education kiosk, which discusses the family of waterlilies, Nymphaeaceae, and traces the lineage of many of the Garden's hybrids. Many of the modern tropical waterlily hybrids were first bred here at the Garden by George Pring during the early part of this century.

A second grant of $25,000 from the Institute for Museum Services, a federal agency, will allow the Garden to complete conservation work on the tree collection, a number of which date back to Henry Shaw's time. Work to date has included remedial pruning and the installation of lightning protection. The plant records section of the horticulture department completed cataloging the entire tree collection and have improved greatly its efforts to enhance the labeling of the living collection.

Also behind the scenes, but of major importance to the Garden's future, were plans for new production greenhouse facilities. The current greenhouses are old, worn-out facilities, simply no longer capable of providing the resources for a world-class garden. New greenhouses are needed to produce more than 90 percent of the bedding and display plants used on the grounds and in the flower shows. The new houses will also move us forward in the areas of production for botanical research and allow for renewed efforts in plant breeding and introductions.

The visible efforts were many during 1986, with new gardens and continuing refinement at the Garden. The unseen efforts, however, were just as important in assuring the Garden will continue its excellence well into the future.

Alan P. Godlewski
Chairman of Horticulture

COMMUNITY

A place to learn, and a place to get away from cares or frustrations. A busy focal point for botanical exploration and training. The place in St. Louis to go if you need facts about plants, or landscaping or threats to the health of our environment.

The Missouri Botanical Garden each year arranges an extensive schedule of exhibits, special programs, displays, festivals, members' events and various other entertainments

The most dramatic success of the year was the rescheduling of the 11th Annual Japanese Festival with the generous support of Fannie May Candies Foundation. The Festival originally scheduled for June, was canceled, then rescued and rescheduled for August. In spite of some confusion, more than 71,000 people came to the Garden during the Festival to experience the culture of Japan. On one day alone, 13,000 visitors were drawn to the festivities.

A variety of other public programs were implemented for special audiences. A new lecture series, "Gardening By Design" was begun in January and February. It provided advice on a full range of gardening topics from experts like Bob Thompson of PBS's "Victory Garden." The series was so popular, it will likely become an annual event.

To bring attention to the fact that the Garden is open until 8 p.m. on summer evenings, the Music Fest series was begun. Music Fest is a series of outdoor concerts on Spoehrer Plaza, offering a range of styles from classical to country.

The Garden joined with the larger community to celebrate the 1986 St. Louis Arts Festival in the fall. A juried show called Young Sculptors' Competition was sponsored by the National Society of Arts and Letters and hosted by the Garden. Visitors were treated to an exhibit by some of the most talented young people in the area.

Private parties, luncheons, and business meetings were another way that people visited the Garden in 1986. The spectacular setting of the Garden, the facility rental program and the quality of catering by Green Tree Gourmet made the Garden a very popular place for private functions. New policies last year gave Garden membership to all couples married at the Garden, and rental discounts to members.

Special events, special discounts and a special feeling of belonging encouraged many to join the Missouri Botanical Garden last year. By year's end there were 18,490 members. This positions the Garden as the leader of all botanical gardens, and all St. Louis cultural institutions in membership. The increase over the prior year is 2000 members or 12 percent. The members provide an important source of both community and economic support. Membership attendance at the Garden increased 42 percent last year, and provided revenues of $925,000.

The hardworking volunteers at the Membership Services Desk in the Ridgway Center sold more than 1100 memberships last year, an increase of 33 percent. In addition to selling memberships, they provide a smiling welcome to the Garden, answer countless questions and helped solve many problems.

Garden members proved last year that they love a challenge. When the Times Mirror Foundation offered a matching challenge grant of $25,000 to increase membership levels, 254 members increased their giving. The year-long challenge was met in only four months.

Members had fun in 1986 as well. Exclusive "members only" events included Rose Evening, Henry Shaw's Birthday Dinner, Flower Show Previews, and Kids and Dads Day. The unforgettable fundraiser of the year was the St. Louis Garden Tour and Finale Party planned by the Members' Board. On June 29, eight spectacular private gardens in the area were on display and enjoyed by 1,000 participants.

The hair-raising event of the year was Henry Shaw's Halloween Garden. On October 26, the Garden was transformed into a haunting playground for nearly 1,000 ghosts, goblins, and costumed characters of all shapes and sizes.

It was an extremely satisfying year. Success was evident in the faces of those who enjoyed the Garden and the activities. It was also a time for planning ahead. One of the most exciting discussions this past year centered on the future of the Garden.

Campaign For the Garden

On September 24, 1986, the Board of Trustees of the Missouri Botanical Garden unanimously approved a new facilities development campaign, called the Campaign for the Garden. This campaign is designed to fulfill the remaining physical development envisioned in the Garden's 1973 Master Plan, so as to effect maximum use of the Garden's resources and enable it to serve the needs of the metropolitan area at an even higher level.

It concentrates on the following:

1. Renovating the exterior and interior of the 26-year-old Climatron, the Garden's tropical plant display/education facility.

2. Constructing a new Temperate House adjacent to and linked to the Climatron, which will replace the Mediterranean House and provide expanded space for the Mediterranean plants and educational exhibits.

3. Replacing several production greenhouses dating from 1912 and adding a new greenhouse range; this work will increase production space by one-third.

4. Constructing the Pavilion of the Center for Home Gardening, an extensive display area that will provide St. Louis with a series of self-contained, residentially scaled garden exhibits.

The total amount of funds sought for the Campaign for the Garden is $16 million over a five-year period. We are inviting corporation, foundations and individuals to make gifts and pledges to the campaign. By the end of 1986, the campaign had raised $4.2 million in gifts and pledges. It was a fitting end for another successful year and an exciting beginning for our shared future.

Pat Rich

Patricia E. Rich
Director of Planning and
Development

FINANCIAL INFORMATION

Statements of Support and Revenue, Expenses and Changes in Fund Balances for Operating Funds. (Unaudited)

PUBLIC SUPPORT AND REVENUE

	Year Ended December 31	
	1986	*1985*
Public support—		
Services provided for Botanical Garden Subdistrict	$ 3,109,003	$2,783,636
Contributions and bequests	2,746,225	1,435,364
Memberships	925,142	776,935
Total public support	$ 6,780,370	$4,995,935
Revenue —		
Admissions	$ 442,516	$ 334,570
Grants and contracts	1,528,457	1,191,342
Net income from Garden Gate Shop	325,901	264,870
Investment income, net	693,517	718,254
Other	459,190	348,407
Total revenue	$ 3,449,581	$2,857,443
Total support and revenue	$10,229,951	$7,853,378

EXPENSES

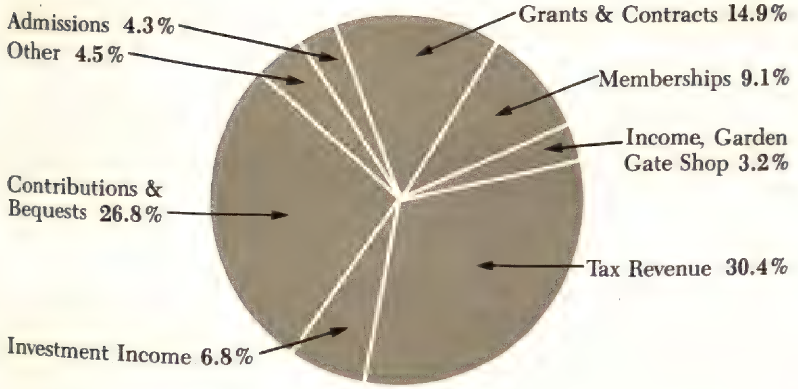
	1986	*1985*
Program services —		
Horticulture	$ 1,140,552	$ 991,914
Research and library	2,534,188	2,288,309
Education	491,966	424,688
Arboretum	178,418	155,963
Maintenance and improvements	850,079	780,141
Utilities	445,590	470,963
Security	192,085	180,451
Tower Grove House	44,859	44,518
Total program services	$ 5,877,737	$5,336,947
Supporting services —		
Management and general	$ 1,699,445	$1,407,558
Membership department	466,301	384,659
Fund raising	235,071	185,119
Total supporting services	$ 2,400,817	$1,977,336
Total expenses	$ 8,278,554	$7,314,283

	1986	*1985*
EXCESS OF PUBLIC SUPPORT AND REVENUE OVER EXPENSES	$ 1,951,397	$ 539,095
OTHER CHANGES IN FUND BALANCES (DECREASE):		
Property and equipment transfers	(783,712)	(279,467)
Transfer of funds	(1,116,753)	(163,687)
FUND BALANCES — BEGINNING OF YEAR	$ (44,208)	$ (140,149)
FUND BALANCES — END OF YEAR	$ 6,724	$ (44,208)

Other Financial Information

FUND BALANCES (DEFICIT):	***Beginning of year***	***End of year***
Operating Funds:		
Unrestricted	$ (44,208)	$ 6,724
Restricted	—	—
Endowment and Similar Funds:		
Henry Shaw Trust	4,890,987	5,270,698
Quasi	4,612,653	5,291,158
Other	515,188	582,843
Land, Building and Equipment Fund	19,357,191	21,959,669
Capital Fund	—	—
TOTALS	**$29,331,811**	**$33,111,092**

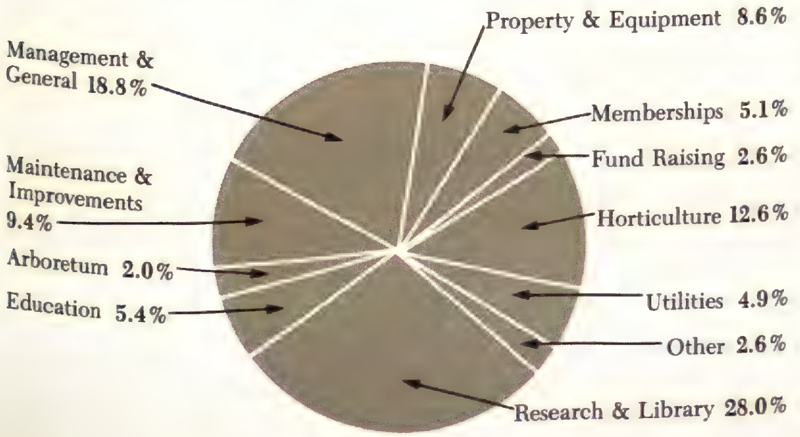
Public Support and Revenue 1986



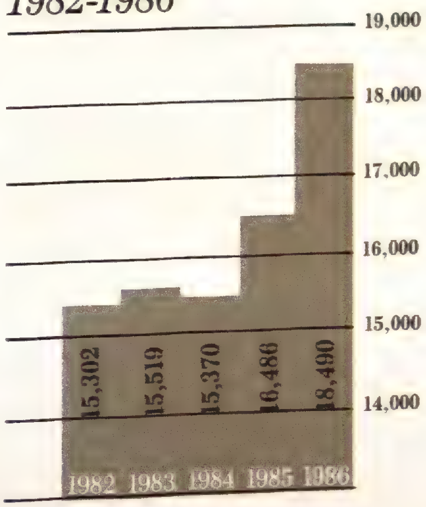
Facts and Figures 1986

Total attendance	658,023
Students in education programs	89,133
Active volunteers	630
Volunteer hours	49,424
Total herbarium specimens added	73,309
Horticultural accessions	3,314

Expenditures 1986



Total Paid Membership 1982-1986



1986 Grant Awards and Contracts

	Activity	Amount
Chautauqua/National Science Teachers Association	*Education*	$ 18,198
Citicorp Person-to-Person, Inc.	*Exhibit*	$ 15,000
Caleb C. and Julia W. Dula Educational and Charitable Foundation (3 yrs)	*Library Acquisitions*	$ 100,000
Harry Edison Foundation	*Library Acquisitions*	$ 5,000
Armand G. Erpf Fund, Inc.	*Research*	$ 2,500
Fannie May Candies Foundation	*Japanese Festival/Promotions*	$ 110,264
Garden Club of St. Louis	*Plant Conservation*	$ 2,500
Edward Chase Garvey Memorial Foundation Trust	*General Operating*	$ 2,500
Institute of Museum Services	*General Operating*	$ 75,000
Institute of Museum Services	*Collections/Conservation*	$ 25,000
Japanese American Citizens League, St. Louis Chapter	*Japanese Garden*	$ 1,000
Mary Ranken and Ettie A. Jordan Charitable Foundation	*Lehmann Building*	$ 50,000
Joyce Foundation	*Education*	$ 68,664
John Allan Love Foundation	*Library Acquisitions*	$ 5,000
Morton J. May Foundation	*Library Acquisitions*	$ 2,500
Missouri Arts Council	*Special Projects*	$ 44,500
Monsanto Company	*Research*	$ 118,000
National Cancer Institute (5 years)	*Research*	$ 653,883
National Council of State Garden Clubs, Inc. (national headquarters and 39 member clubs)	*Research*	$ 5,594
National Endowment for the Arts	*Library/Conservation*	$ 10,000
National Geographic Society (5 projects)	*Research*	$ 57,897
National Museum Act	*Research*	$ 15,000
National Science Foundation (11 projects)	*Research/Education*	$ 873,416
National Science Foundation	*Lehmann Building*	$ 250,000
Jessie Smith Noyes Foundation	*Research*	$ 208,115
Pioneer Hi-Bred International	*Research*	$ 20,000
Pitzman Fund	*Education*	$ 7,000
St. Louis Herb Society	*Conservation*	$ 2,023
St. Louis Schools Magnet Program	*Education*	$ 18,123
St. Louis Schools Partnership Program	*Education*	$ 10,140
Norman J. Stupp Foundation	*Education*	$ 15,000
Times Mirror Foundation	*Membership Challenge*	$ 25,000
U.S. Department of Education	*Library*	$ 240,044

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Hollyhock
(Althaea rosea Cav.)

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Black Locust
(Robinia Pseudo-acacia L.)

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The Missouri Botanical Garden thanks the following local and national companies which have contributed unrestricted operating support in 1986:

$2,000 or More
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Brown Group Inc.
Citicorp Person-to-Person, Inc.
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Hound's Tongue
(Cynoglossum officinale L.)

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The Missouri Botanical Garden wishes to acknowledge the generosity of the following local and national corporations which have contributed $10,000 and more (cash and/or in-kind) 1950-1986:

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The Missouri Botanical Garden thanks these local and national corporations which provided matching gifts in 1986 to employees' charitable contributions to the Garden:

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The Missouri Botanical Garden received distributions from the following estates and trusts in 1986:

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Susan Rassier Buder Memorial Trust
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Estate of Harry W. Lang
Estate of Arnold C. Miller
Estate of Ruth E. Ratcliffe
Viola J. Reynolds
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Heritage Society

We are grateful to the following who have notified us of their testamentary gifts to the Garden:

Donald H. Bergmann
Mrs. R. I. Brumbaugh
Leliaetta Bruns
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Lina D. Dickerson
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Katherine W. Hoblitzelle
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The Missouri Botanical Garden gratefully acknowledges the following agencies and organizations that have awarded support in 1986:

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National Science Foundation
St. Louis Schools Magnet Program
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State of Missouri, Department
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The Missouri Botanical Garden expresses its gratitude to the following individuals and organizations for their cumulative gifts, 1950-1986:

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Mr. and Mrs. Andrew R. Zinsmeyer
Mr. and Mrs. Sander B. Zwick
Anonymous

Flowering Dogwood
(*Cornus florida* L.)

Missouri Botanical Garden Staff

Dr. Peter H. Raven, *Director*
As of December 31, 1986
**Indicates part–time employees*

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John Behrer, *Superintendent*
Glenn Beffa
Carol Davit*
Joyce Davit*
William Davit
Betty Klott
Jonathan Watt

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Ronald Liesner
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Heidi Threnn
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Diana Winkelmeyer
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Jane Brown
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Linda Raming
Mary Ransdell
Mildred Whirley

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Deanna Michaels
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Denise Reeves
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Marilyn Svejkosky, *Gift Sales Supervisor*
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Kevin Sir
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Darman Williams
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Stephen Wolff
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Kathleen Miller*
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Gerald Cherry
Timothy Cleveland
Douglas Cullmann
James LaBlance
Kevin Mattingly
Richard Muraski Jr.
Shirley Murphy
Alan Osherow
Charles Reichardt
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Janet Poelker

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Melanie Clements
Lee Fox
Deborah Graham
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Sharon Little

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Jeany Davidse
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Jonathan Lovett
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Amy Pool
George Schatz, Ph.D.
James Solomon, Ph.D.
Warren Douglas Stevens, Ph.D.
Julian A. Steyermark, Ph.D.
Mary Sue Taylor
Duncan W. Thomas, Ph.D.
Henk van der Werff, Ph.D.
James L. Zarucchi, Ph.D.

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Rebecca Bechtold*
Theresa Broleman*
Bonnie Bruenger*
Kimberly Burton*
Marie Cook
Gina Corley*
Gerard Hannibal
Jill Hartung*
Nancy Hediger*
George Herzing
Virginia Hoffmeier*
Janet Kassak
Ann King*
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Judy Luebbert
Kathleen Luepke*
Virgie McNeal*
Bernadine McNeary*
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Seth Myles*
Joan Smith*
Carolyn Stelzer
Sandra Stewart*
Tyrone Walker
Daniel Watkins*
Maybeth Weinhold*
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John Hancock, *Safety/Security Coordinator*
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Violet Dettmann*
Madeline Donaldson*
Frank Foley*
Margaret Glenn
Holly Hanewinkel*
Lucille Kraus*
Fern Truscheit*

STAFF LENGTH OF SERVICE

20 OR MORE YEARS

Leonardo Mourré

15 — 19 YEARS

Walter Behrendt
Paul Brockmann
Marie Cook
Thomas B. Croat
Marshall Crosby
W. G. D'Arcy
William Davit
Margaret Glenn
Peter H. Raven
Marilyn Svejkosky
Stephen Wolff

10 — 14 YEARS

Barbara Craighead
Gerrit Davidse
Alwyn H. Gentry
Peter Goldblatt
June Hutson
Brian LeDoux
Ronald Liesner
Kevin Mattingly
Cheryl Mill
Charles Orner
William Wagner
Brenda Ward
Brian Ward
Margaret Zonia

5 — 9 YEARS

John Behrer
Aileen Bunton
JoAnn Collins
Jeany Davidse
Stephanie Diestelkamp
Susan Finley
Julie Gentry
Alan Godlewski
James Henrich
Martha Hinck
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Nadine Penno
Amy Pool
Joan Quante
Denise Reeves
Patricia Rich
Karen Stallard
Warren Douglas Stevens
James Solomon
Carol Unger
M. Jessica Ventimiglia
Darman Williams

Volunteers With 100 Hours or More — 1986

Peggy Abel
Guides

Elizabeth Adamie
Botany

Marie Ahearn
Education Office

Horace Allen
Floral Display

Virginia Appel
Guides

Rosemary Armbruster
Library

Frank Arnoldy
Answer Service/Master Gardener

Celina Aubuchon
Botany

Lester Aubuchon
Climatron

Dorothy Bachar
Tower Grove House

Albert Baeyen
Greenhouse

Margaret Baldwin
Buyer Gate Shop

Charlotte Ballard
Boxwood Garden/Herb Garden

Margaret Barr
Library

Mary Randolph Ballinger
Members' Board

Bill Bauer
Botany

Inez Bender
Buyer Gate Shop

Ann Bennett
Botany

Bill Betz
Botany

Billie Beyer
Answer Service/Master Gardener

Adrienne Biesterfeldt
Guides/Climatron/Woodland Garden

Lillian Biggs
Answer Service

Virginia Blume
Tower Grove House

Dorothy Blumenthal
Maintenance Office

June Booth
Volunteer Office

Dale Boring
Climatron

Henry Bowman
Greenhouse

Joyce Broughton
Plant Records

John Brown
Answer Service/Master Gardener

Robert Buck
Library/Rose Garden

Herb Bueltmann
Library

Bertha Burton
Botany

Virginia Cash
Botany

Gene Catalano
Climatron

Katherine Chambers
Guides/Volunteer Instructors

Mabel Chouinard
Tower Grove House

Art Christ
Arboretum

Bill Clark
Guides/Tower Grove House

Barbara Cook
Guides

Pat Corrigan
Botany

Mike Costello
Rose Garden

Clem Craig
Education Greenhouse

Roy Cummings
Botany

Diane Cutaia
Botany

Don Culberson
Answer Service

Dolly Darigo
Botany

Lynn Davis
Education Greenhouse/Botany

Nan Day
Guides/Volunteer Instructors

Roberta Dearing
Guides

Ruth DeFabio
Gate Shop

Frank Delonjay
Plant Shop

Edna Dependahl
Guides/Climatron

Eugenie Deutsch
Tower Grove House

Mark Dienstbach
Knolls Area

Marie Dienstbach
Knolls Area

Si Dietz
Answer Service

Rienette Diller
Master Gardener

Adam Donges
Arboretum

Ellen Dubinsky
Members' Board

Herman Easterly
Botany/Greenhouses

Albert Edmondson
Japanese Garden/Climatron

Mary Ely
Guides/Volunteer Instructors

Emma Engelbrecht
Library

Frank Enger
Master Gardener/Display Garden Greenhouse

Virginia Eschrich
Tower Grove House

Dorothy Evers
Gate Shop

Arden Fisher
Development

Mary Floerke
Director's Office

Desmond Fraser
Plant Shop

Dorothy Frese
Tower Grove House

Jill Frey
Tower Grove House

Dorothy Fritzsche
Volunteer Instructors

Ray Garlick
Arboretum

Betty Garrett
Gate Shop

Irene Geer
Tower Grove House

Ed Gildehaus
Answer Service/Master Gardener

Russ Goddard
Arboretum

Laura Goedeker
Plant Shop

Marian Gould
Members' Board

Ann Graeff
Botany

Charla Gray
Members' Board

VOLUNTEERS WITH 100 HOURS OR MORE — 1986 continued

Jackie Greco
Volunteer Office
Josephine Griffin
Plant Shop
Rena Gross
Gate Shop
Elenor Gruenewald
Plant Shop
Florence Guth
Director's Office
Linda Gwyn
Guides
Frank Hanchett
Answer Service/Master Gardener
Chuck Harris
Answer Service/Master Gardener
E.F. Hartke
Maintenance
Margaret Hartung
Botany
Lorraine Hatscher
Gate Shop
Imogene Hazzard
Botany
Pauline Heinrich
Tower Grove House
Lynn Hepler
Master Gardener
Ethel Herr
Development Office
Marian Herr
Development Office
Alyce Hildebrandt
Volunteer Instructors
Helen Hilliker
Display Garden/Greenhouse
Rita Hirson
Gate Shop
Albert Hoehn
Answer Service/Master Gardener
Bette Hoke
Botany
Frank Holdener
Answer Service
June Holtzmann
Library
Nelson Hower
Plant Records
Gene Jarvis
Climatron
Pauline Jaworski
Volunteer Instructors
Eric Jenkins
Director's Garden
Georgene Jenkins
Tower Grove House
Becky Jennings
Display Garden
Doris Johnston
Answer Service
Ruth Jonas
Answer Service
Betty Jones
Membership Information & Services
Ellen Jones
Tower Grove House Historical Committee/Members' Board
Joseph Jones
Membership Information & Services
Eleanor Kamer
Botany
Nadine Kelly
Tower Grove House
Merle Kind
Tower Grove House
Mary Jane Kirtz
Guides
Pauline Kittlaus
Greenhouse/Library
Mim Kittner
Chairman Membership Information & Services/ Members' Board
Ruth Klipsch
Botany
Joyce Knobbe
Volunteer Office
Mary Kordonowy
Gate Shop
Helen Kuehling
Guide/Volunteer Instructors
Joy Last
Tower Grove House
Cliff Lecoutour
Answer Service
Harriet Leff
Gate Shop
Patricia Lehleitner
Director's Office
Betty Licklider
Volunteer Instructors
Ken Lindemann
Answer Service/Master Gardener
Mary Longrais
Members' Board
Robert Lumley
Floral Display
Kathy Lupo
Guides
Paul McClinton
Plant Records
Carol McCloskey
Answer Service/Tower Grove House
Ruth McClure
Greenhouse/Gate Shop
Bert McDonald
Plant Shop
Marshall Magner
Answer Service/Master Gardener
Eleanora Markus
Tower Grove House
Robert Martens
Knolls Area
Joe Meis
Answer Service
Nell Menke
Arboretum
Carmi Messina
Director's Office/Special Projects
Lillian Metzger
Botany
Jean Milligan
Library
Sara Moore
Plant Records
Shirley Moore
Gate Shop
Isabelle Morris
Guides/Coordinator, Master Gardeners, Members' Board
Clara Moult
Gate Shop
Joan Murphy
Development
Mico Murphy
Members' Board
Rosemary Murphy
Answer Service
Lorraine Myers
Volunteer Office
Bernice Nolte
Development Office
Sue Oertli
President, Members' Board
David Orthwein
Director's Garden
Pat Pahl
Botany
Margaret Pape
Gate Shop

Gert Pappert
Plant Shop
Carl Parres
Plant Shop
Mary Ann Pelot
Answer Service/Master Gardener
Bea Perrin
Volunteer Instructors
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Education Greenhouse
Bill Phillips
Botany
Mary Jean Poetz
Plant Shop
Margaret Point
Education Office
Kaye Quentin
Climatron
Sue Reisel
Guides
Alma Reitz
Answer Service
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Tower Grove House
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Botany
Laura Riganti
Gate Shop
Vicky Roberson
Plant Shop
Marcia Robinson
Botany
Walter Rodenroth
Botany
Ruth Rogers
Tower Grove House Historical Committee
Susie Russell
Arboretum
Bobbe Sandvoss
Gate Shop
Bill Satkowski
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Tower Grove House Historical Committee
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Tower Grove House
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Warren Tabachik
Climatron
Anita Tarantola
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Carol Taxman
Answer Service/Master Gardener
Mattie Thompson
Answer Service/Plant Shop
Nancy Thompson
Guides
Midge Tooker
Guides
George Tribble
Answer Service/Master Gardener
Joanna Turner
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Carolyn Vassallo
Special Projects
Linda Vaughan
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Aurelia Voelker
Gate Shop
Mary Wahl
Library
Charles Walter
Answer Service
Yolanda Wanek
Volunteer Instructors
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Buyer Gate Shop
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Gate Shop
Carol Wilson
Answer Service
Sally Wilson
Climatron
Elmer Wiltsch
Answer Service/Master Gardener
Mary Wind
Tower Grove House
Sallie Wood
Master Gardener/Plant Shop
Bob Worden
Rose Garden
John Wright
Japanese Garden
Jean Wrisley
Coordinator, Volunteer Instructors
Becky Young
Spoehrer Plaza Area
Grace Yount
Tower Grove House
Jean Zinsmeyer
Members' Board
Vi Zumwalt
Gate Shop

Missouri Primrose
(*Oenothera macrocarpa* Nutt.)

1986 Climatron Campaign

The following individuals and organizations generously contributed in 1986 to a "25th Anniversary" campaign for the first phase of fundraising to renovate the landmark Climatron:

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Mr. and Mrs. Rudiger Laufhuette
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Mr. Harvey A. Levy & Dr. Mildred F. Levy
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Ms. Doris C. Martin
Mr. George L. Martin
Mr. and Mrs. William C. Martin
Mr. Roy G. Mason
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Mr. and Mrs. William C. Nusbaum
Ms. Maureen O'Day
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Mr. Edward O'Neill Jr.
Mr. and Mrs. Stephen C. Oris
Dr. and Mrs. Robert Paine
Cathy Panetti
Miss Nicoletta E. Parato
Mr. and Mrs. Michael Pavlakes
Mr. and Mrs. Walter T. Peiper
Ms. Susan Peters
Mr. and Mrs. Jeffrey A. Pierce
Mr. Paul P. Pierce
Mr. David Piloski
Mr. Craig J. Plahn
Mr. and Mrs. Roy Poggianti

Dr. and Mrs. Reese H. Potter
Mr. and Mrs. Rick Powell
Mr. Donald R. Prior
Mr. and Mrs. Grant Reed
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Savings of America
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Mr. Irwin E. Tober
Mrs. Antointette Towers
Trenton Woman's Club
Irene H. Van Hooser
Virgil Vaughn
Mr. and Mrs. William H. Vogan
Miss Evelyn Vogel
Mr. Edward M. Vokoun
Mr. Douglas A. Warren
Mr. Richard L. Wasson
Mr. James D. Webb
Paul Weiss
Mr. Robert A. Wells
Miss Carolyn Whitmore
Mr. and Mrs. William W. Wilcox
Mr. Jerry R. Williams
Mr. Frank S. Williamson
Mrs. C. L. Windsor
Dr. and Mrs. Tyrus D. Winter
Ms. Marlene H. Wirtel
Ms. Deborah A. Wolfe
Women's Day Fellowship
Mr. Evan L. Wright
Mr. Louis Wyrsch
Mrs. Jewell I. Yarbrough
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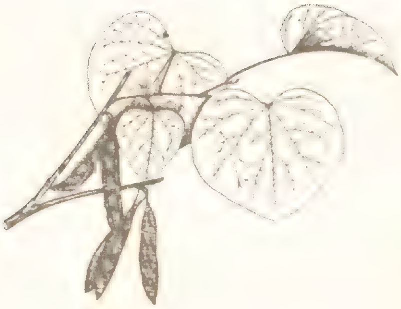

Redbud
(*Cercis canadensis* L.)

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Missouri Botanical Garden

BULLETIN

VOLUME LXXV, NUMBER 5 JULY-AUGUST 1987

Bringing the Garden Home

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On the cover: Architect's model of the Pavilion of the Center for Home Gardening. The building, which is included in the capital fund campaign, will demonstrate gardening techniques on a scale the homeowner can utilize.

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The BULLETIN is sent to every Member of the Garden as one of the benefits of membership. For a contribution of as little as $35 per year, Members also are entitled to: free admission to the Garden, Shaw Arboretum, and Tower Grove House; invitations to special events and receptions; announcements of all lectures and classes; discounts in the Garden Gate Shop and for course fees; and the opportunity to travel, domestic and abroad, with other Members. For information, please call (314) 577-5100.

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Comment

Campaign for the Garden

The Missouri Botanical Garden has an unbroken record of achievement that began in 1859 when Henry Shaw pledged his fortune to establish an institution "for the use and enjoyment of the public for all time."

Shaw knew that his garden, to be a factor in the affairs of the world, would need to be more than merely beautiful and passive. He devised a plan that tied displaying plants to a rigorous approach to education and scientific investigation.

Farsighted and unusual for those early frontier days, Shaw's vision has been confirmed and his pledge has been enlarged upon by generation after generation of benefactors. The Garden's long-term growth has been made possible by the ties that it forged with its Members, the business community and its many friends throughout the metropolitan area.

The Garden now seeks to extend its services by raising $16 million over three years from private sources to permit the renovation and reconstruction of major facilities, including the Climatron, Temperate House, Center for Home Gardening Pavilion and production greenhouses to carry out educational, display and community service programs.

The campaign components fulfill the goals of the Garden's Master Plan, launched in 1973, which has produced the Japanese Garden, the Ridgway Center, and a number of specialized gardens, fountains, services and other facilities.

The fund raising effort needed for such an ambitious program has gotten off to a tremendous start—we have raised in excess of $7 million already. Highlights of the program are explained in the story on the next page and details will appear in future issues. For now, let me again thank those individuals, foundations and companies who have already contributed and ask the rest of you to consider a gift to this program in the future.

Peter H. Raven

Work is proceeding on schedule with the reconstruction of the paths and coping of the lily pools in the area between Flora Gate and the Climatron and will be completed in time for the Japanese Festival.

Fannie May's Generosity Continues

Fannie May Candy Shops, Inc. has announced that for every pound of candy sold in their 13 St. Louis area retail shops, they will donate 50 cents to the Missouri Botanical Garden through the Fannie May Candies Foundation. All donations will be used toward reinforcing and repairing the badly eroded shoreline of the Japanese Garden's lake.

The promotion will run from June 1 to September 1, 1987. An identical promotion last year raised $25,000 for the Garden.

The Fannie May Candies Foundation is the sole sponsor of the Garden's 12th annual Japanese Festival, August 29 - September 7. Fannie May also sponsored last year's Festival, rescuing the popular cultural event after it was canceled due to lack of financial support.

The
CAMPAIGN
for the Garden

CAPITAL FUND DRIVE IS ANNOUNCED

"Plans for the future are ambitious and directed toward the Garden's fine tradition of service."

—THOMAS F. EAGLETON

ABOVE: The Campaign for the Garden Steering Committee: (First row from left) Robert E. Kresko (Committee Chairman), C. C. Johnson Spink, Peter H. Raven, John H. Biggs. (Second row from left) Charles F. Knight, Tom K. Smith Jr., Lucius B. Morse III, O. Sage Wightman III, John K. Wallace Jr., Mrs. Walter G. Stern, Clarence C. Barksdale. Not pictured are: William H. T. Bush, Robert R. Hermann, Mrs. Fred A. Oberheide, William R. Orthwein Jr. and Warren M. Shapleigh.

TOP: Former Senator Thomas F. Eagleton delivers the Campaign luncheon's keynote address.

MISSOURI BOTANICAL
JUL 7 1987
GARDEN LIBRARY

On May 18, the Garden publicly announced its $16 million capital fund drive at a luncheon for Garden Trustees, donors, the Members' Board, the media and other interested supporters. Robert E. Kresko, a trustee and chairman of the campaign's Steering Committee, stated that almost $7 million in gifts and pledges had already been raised toward the total.

Dr. Peter H. Raven, the Garden's director, described the campaign components and their role in fulfilling the Master Plan for development, adopted in 1973.

"More than a decade ago," said Raven, "we developed a long-range Master Plan in preparation for the challenges of the 21st century. Since that time, extraordinary growth and expansion has occurred. Annual attendance now tops 650,000. Our membership has reached 20,000 families, making the Garden the most extensively supported cultural institution in St. Louis. The Campaign is an opportunity for the Garden to continue its service to the community and to fulfill the goals set in that Master Plan."

John H. Biggs, president of the board of trustees, noted the initial work in assembling the drive and recognized the campaign's Steering Committee. He additionally recognized the donors of five remarkable gifts, which have set a magnificent example for other contributors: a gift from Mrs. Harriet Spoehrer, a trustee, and pledges of $750,000 each from the Anheuser-Busch Charitable Trust, the Emerson Electric Charitable Trust, the Monsanto Fund and the Southwestern Bell Foundation.

Former Senator Thomas F. Eagleton delivered the keynote address, reminiscing about growing up in the Garden's immediate neighborhood and speaking of the importance of the Garden's work and of this Campaign to carrying out that work:

"...it has often given me a thrill to realize that within my own beloved neighborhood there existed an institution, respected and powerful, that had an effect on science and education around the world.... Its plans for the future are ambitious and directed towards the Garden's fine tradition of service.... The Missouri Botanical Garden has all the qualities of leadership to insure a successful campaign—a strong and effective board of trus-

continued on next page

The CAMPAIGN *for the Garden*

continued

tees, a dedicated staff, many, many friends, and a clear and pressing need for help."

The major campaign components are:

1. The Climatron. Work includes a complete interior and exterior renovation, replacing the panes in a reinforced dome and re-landscaping the plant displays to recreate the feeling of a tropical forest. **Gift Need: $6,240,000.**

2. The Temperate House. This building will replace the 1912 Mediterranean House, approximately doubling the current display space and allowing the Garden to broaden the types of temperate-zone plants on exhibit. The house's exterior will visually complement the still-modern looking Climatron. **Gift Need: $3,830,000.**

3. Production Greenhouse Replacement and Renovation. These non-public greenhouses are the very heart of the Garden's ability to mount year-round indoor and outdoor displays. This effort will replace several houses dating from 1912 and renovate several more, resulting in modern, energy-efficient structures and specialized growing spaces increased in capacity by one-third. **Gift Need: $2,600,000.**

4. Pavilion of the Center for Home Gardening. This is the initial phase of an extensive project which will eventually display 22 residentially scaled garden exhibits. The Pavilion will serve as the focal point and interpretive/educational center for the project.
Gift Need: $2,500,000.

5. Program Initiatives in New and Rehabilitated Buildings. The above plans for expanding displays require the development of new, creative education programs and exhibits to take full advantage of increased service capabilities. **Gift Need: $1,280,000.**

Within each component, there are ranges of smaller gift opportunities. Gifts of an appropriate size will enable donors to name components or portions of components within the overall campaign. Contributions are sought from corporations, foundations, government and private individuals.

If you wish to know more about the campaign or make a gift to the drive, please call the Campaign Director at (314) 577-5120 or mail an inquiry to: The Campaign for the Garden, Missouri Botanical Garden, P.O. Box 299, St. Louis, Missouri 63166-0299. ■

(From left) Frederick Atwood III, C. C. Johnson Spink and Robert Brookings Smith.

John Biggs, (left) president of the board of trustees, confers with Robert Kresko, chairman of the campaign's Steering Committee.

Garden Trustees (from left) Jules Campbell, Mrs. Harriet Spoehrer and Joseph Bascom enjoying the afternoon.

Mrs. Tamra Raven discusses the new ~~interior~~ landscaping plans for the Climatron with Laura and William Orthwein.

Report from Venezuela

Bruce K. Holst

APARAMAN-TEPUI...CONQUERED!

Garden botanist Bruce Holst became one of the first people to reach the summit of Aparaman-tepui in Venezuela.

In a recent issue of the *Bulletin* (November-December, 1986) Dr. Julian Steyermark, curator at the Missouri Botanical Garden, reported on an expedition to a unique area of Venezuela known popularly as the "Lost World." In that article, he mentioned a "tepui" (the Indian name for a flat-topped, vertical-walled mountain) that he has had his eye on for nearly 43 years to explore and make botanical collections. Several attempts had been made to land on it by helicopter, one by ourselves in May of last year, all of which resulted in failure.

I am happy to report here that through a joint effort of the Missouri Botanical Garden, the Terramar Foundation of Venezuela and GEO Magazine of Germany, Aparaman-tepui has been visited for the first time ever and plants collected during a three-day stay on the summit as well as exploration of four other tepuis, two of which have been only visited briefly once before.

We made our base camp at the same locality along the Acanan River that we had last year. Several small planes ferried in our gear and food to last us the next two weeks. Along on the expedition were several Venezuelan scientists including another botanist, a mammal parasitologist, a mycologist, an ecologist and several photographers.

The following day the helicopter arrived and we began making the many flights necessary to carry everything up to establish a camp on Murisipan-tepui, where I had landed last year for a couple of hours to collect plants. We found a perfect place, right next to a lagoon with fresh water surrounded by flat rocks where we could pitch the tents. The summit of this tepui has several deep fissures, some of which have tunnels that lead off in various directions. We lowered ourselves with ropes into one and followed a tunnel that led to a ledge on the sheer wall where we got a spectacular view through the mist to the dark green forest below and several of the other magnificent tepuis in the area. There we found in full bloom a beautiful yellow-flowered bromeliad that is most likely a species new to science.

The spectacular Aparaman-tepui, which rises up nearly 5,000 feet directly above the forest below, has one of the most eroded and dissected surfaces of the more than one hundred tepuis that make up the Lost World region. The entire summit consists of a series of huge sandstone rock columns surrounded by very deep crevices. There are three different levels on the summit: the tops of the columns that have sparse, low vegetation and are directly exposed to the atmosphere; a middle level, 50—100 feet down that is protected from the wind and has enough soil accumulated to support shrubs and small trees; and then the "catacombs," an elaborate series of tunnels and crevices that appear to run from one side of the tepui to the other. They are usually so dark and deep that only shade-loving plants such as ferns and mosses grow and only near the surface at that. The crevices are frequently hidden by the vegetation of the middle level, and much care must be taken to avoid a long fall. Most are too deep to see the bottom.

Landing was not as much of a problem as we had thought. With a good helicopter pilot and fair weather, we were able to land on three different columns. Our team, including myself, Ramón Blanco, a mountain climber, and Armando Subero, photographer, amateur mycologist and neurosurgeon, set up camp on top of one of the columns as near as possible to a big "green" rock that stood out like a huge emerald amongst the other black, algae-covered boulders. We began our exploration by lowering ourselves down to the middle level with ropes. The danger of the hidden crevices became apparent to me very soon. As I walked along marvelling too intently at the wonderful plants, the ground suddenly disappeared below my feet. My instinctive reaction of throwing my elbows out to stop my fall worked, but I was left with my feet dangling until my colleagues could come back and pulled me out. After a considerable struggle, using our climbing equipment at times, we reached the green rock, but were dismayed to find that its 50-foot vertical walls offered no chance for scaling, so we had to content ourselves with crawling through the tunnels under and around the rock, collecting in the dark fern grottos. After that we headed for the wall, hoping to find some different habitats to collect in, but it was impossible to walk in a single direction for any more than a couple of feet and very difficult to get to a place that we actually wanted to go. After five hours and only a short distance covered we were forced to head back due to the late hour, but with collecting bags full of samples from this unique tepui's flora.

We had originally planned to stay for only two days on this mountain, so on the third day we packed our things, prepared the specimens, and sat down to wait for the 9 a.m. arrival of the helicopter. If we had had a radio, we could have learned that a bad weather front had kept the helicopter from getting through and used the time for another day of exploring and collecting. As it was, we had to stay close to camp in expectation of its arrival. This

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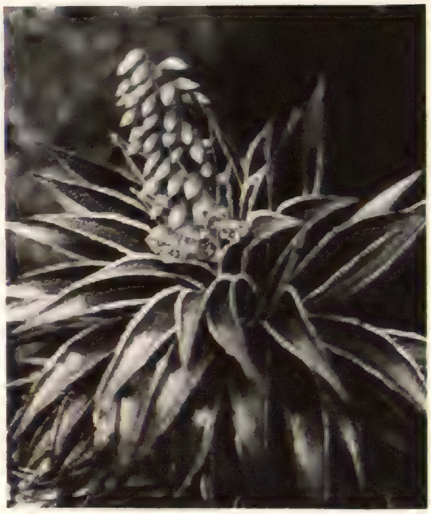


This yellow-flowered bromeliad found in a crevice on the summit is most likely a species new to science.

A "lost world" valley on top of Camarcaibarai was covered with dense vegetation and huge boulders.

Setting up camp on top of huge sandstone column on Aparaman-tepui.

was the only tepui that we visited that had no running water so as we used up the last of the water that we had brought along in jugs, we resorted to a common bromeliad that forms cups and collects rain water in large enough quantities for drinking.

It was the most peaceful day of my life that I can remember passing, the only noises being the one or two bees or flies that drifted by lazily looking for flowers, or in the case of the flies, a botanist to bother. The parakeets would fly out from the green rock only in the morning and evening, and their scandalous cries would echo against the columns as they flew by low at an amazing speed expertly navigating the channels. Other birds were very curious to see their first humans ever and would come up very close to investigate such an unusual sight. Unsettling though, were the hummingbirds that swoop up with a blur of wings, at times to within a foot of your face and remain hovering for a few seconds until they are certain that there is no nectar to be found, then in a blink of an eye they are off searching for something sweeter. They threw me off balance a couple of times, which can be dangerous on that mountain. The only other animal that we saw was late at night when it flapped by slowly and somewhat erratically, making an unusual clacking sound. It circled around the camp twice, which was barely illuminated by our small lantern through the heavy swirling fog, and then quickly disappeared into the night. It didn't turn out to be an Aparaman-odactyl, but was, according to Ricardo Guererro, the parasitologist who was along on the trip, a kind of insect-eating bat.

Besides Murisipan and Aparaman-tepui, we also visited a couple of others, Ptari-tepui, which has only been visited twice before, Camarcaibarai-tepui, where we had spent a couple of days on its slopes last year, but of which the summit has only been visited briefly once before, and Auyan-tepui, one of the largest of the tepuis and home of Angel Falls, the highest waterfall in the world.

Our trip to Ptari-tepui was brief. We were dropped off for only an hour and a half while the helicopter ferried supplies and personnel to other camps. We ran around like mad, collecting as many plants and taking as many pictures as possible in that short time. The summit of this tepui is quite different from the others in that it is mostly flat, so it was unusual to be able to walk for more than a hundred feet without having to negotiate the pinnacles or crevices.

Camarcaibarai was a typical tepui in its broken up, eroded nature, and from the air it looked like any normal spectacular tepui. But after landing, we quickly realized that it had an elegance of its own. Deep canyons slice the summit from one side to the other. Huge black boulders of every imaginable size and shape are strewn across the landscape. A perfect amphitheatre was carved out of the side of one of the canyons right next to our camp and the most beautiful sight of all, a "lost world" valley with vertical walls and a flat bottom covered by dense vegetation and swampy savannas, out of which rise columns resembling totem-poles to more than one hundred feet high. We worked on this mountain for five days between two groups and were able to explore quite a bit of the summit and put together a good collection of plants.

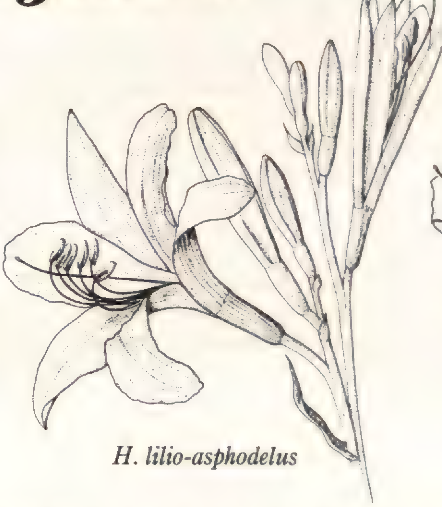
The last tepui we visited was Auyan-tepui. With a surface area of 270 square miles, it ranks as one of the five largest. Its massive vertical walls are impressive, and the many different habitats allow it to be very rich in plant life. We set up camp in an area on the south-central flank next to a black-water river that flows into the Churun valley, where Angel Falls is located. We spent four days there studying the vegetation and animals. Armando Michelangeli, president of the Terramar Foundation, and Ricardo Guerrero spotted tracks of a puma, adult and young, the first time that a big cat has been reported from a tepui summit. After four days there, we returned to our base camp, prepared our material and headed back to a much more menacing place, the big city where the real work of processing and identifying begins.

This expedition was very fortunate in that Mother Nature gave us her blessing of 12 days of perfect weather, almost unheard of for the summits of the tepuis. They are normally obscured in a thick fog, and precipitation can be considerable. Last year we were forced to abandon our camp on the slopes of Camarcaibarai-tepui after three days of persistent rain. This time nearly everyone was red and blistered from the bright sun.

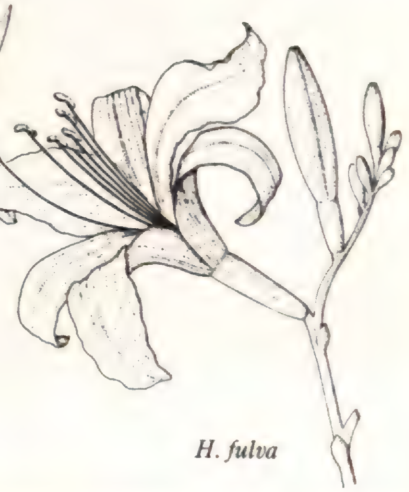
Duplicates of the plant collections were left at the National Herbarium in Caracas, and the rest were brought back to the Missouri Botanical Garden where they will be incorporated into the herbarium. I wish to thank the Terramar Foundation for their work of organizing and providing logistical support for the trip and Uwe George of GEO magazine and Dr. Julian Steyermark for financial support. ■

Gardening at the Garden

Daylilies



H. lilio-asphodelus



H. fulva

This summer Garden visitors will enjoy finding the new Jenkins Daylily Garden along the east wall of the Garden between the Flora Gate and the Museum Building. This elegant addition to the Garden is the gift of Mrs. Ada G. Jenkins Kling in memory of her husband, Stuart Jenkins. Its goals are to be stunningly beautiful and educational. The daylily collection includes recent award-winners, flowers showing a broad array of shapes and colors, historical cultivars, and species. The display is accompanied by interpretive signs. Also, don't miss the Garden's mature daylilies in the Dry Stream Garden in the Knolls. Much gratitude is due Ed and Mary Schnarr for help and inspiration in obtaining daylilies and in planting the new garden.

The author of this article is Elisa Conn, a graduate student in horticulture at Texas A & M University, who was an intern at the Missouri Botanical Garden during the planning phases of the Jenkins Daylily Garden. At that time she took an interest in daylilies that culminated in her devoting her Master of Agriculture thesis to them. Elisa has contributed text for the signage program in addition to writing this article.

A Primer for the new Jenkins Daylily Garden

by Elisa Conn

The *Hemerocallis*, or daylily, is a popular perennial and has changed a great deal from its few original species due to extensive hybridization. Daylilies are members of the family Liliaceae and are not true lilies in that they are not included in the genus *Lilium*. *Hemerocallis* means "beauty for a day" because most flowers only last one day. The daylilies are all herbaceous with flat, linear leaves. The large, colorful, basically funnel-shaped flowers are borne on flower stalks or scapes that rise from the center of the mound of foliage. Today the flowers range in color from yellow and orange to red, pink, and purple. There are daylilies with the blooms ruffled, recurved, double, and blooms with "eyes" in the center. Much of this variation can be credited to Arlow B. Stout, a geneticist and plant breeder who worked with The New York Botanical Garden beginning in 1911.

The Missouri Botanical Garden has constructed a daylily garden. The purpose of this garden is not only to display many of the newer more showy cultivars, but also to give the public a historical look into the genus by displaying some of the important species used by Stout and others in their hybridizations.

All wild species of *Hemerocallis* are native to Asia, mostly China and Japan, and have been cultivated in China for hundreds of years as food and medicine. In a translation of *Materia Medica*, a Chinese herbal written in 656 A.D., *Hemerocallis* is said to "quiet the five viscera (the heart, lungs, liver, kidneys, and stomach), benefit the mind and strengthen the will power, give happiness, reduce worry, lighten the body weight, and brighten the eye." The first written record of the daylily appears in the writings of Confucius around 500 B.C. The daylily was referred to as *Hsuan Ts'ao*. *Hsuan* means "to push aside or forget" and *Ts'ao* means "herb." This name may have been given to the daylily due to hallucinogenic effect from eating the young shoot.

The daylily has also been cultivated for hundreds of years as a vegetable. The dried flower buds are sold in China as *gum-tsoy*, meaning "golden vegetable," or *gum-jum*, meaning "golden needles." They are eaten mostly in soups, meat dishes, and with noodles. The flavor of the cooked flowers has been compared to creamed onions.

Eventually the daylily was introduced to Europe and accounts of it began to appear in European herbals of the 16th century. The two daylilies that appear to have been cultivated during this time were *Hemerocallis lilio-asphodelus*, the Yellow Daylily, and *Hemerocallis fulva*, the Tawny Daylily. The Yellow Daylily was recorded as growing outside of gardens mainly in the vicinity of old castles and cloisters over a large area of middle Europe. The Yellow Daylily blooms in early summer and bears large, fragrant, lemon-yellow flowers. Both of these species are believed to have been introduced to North America by the English colonists. During the second half of the 19th century, there were several accounts of *Hemerocallis fulva* growing wild from New Brunswick and Ontario to Virginia and Tennessee. This species blooms in midsummer and is the roadside daylily with rusty-orange flowers familiar to most people.

Arlow B. Stout, although not the first to hybridize daylilies, is responsible for setting into motion the extensive hybridization and recent interest in daylilies in the United States. Stout's interest in daylilies was sparked in 1897 when he was 21 years old. He noticed at one end of his porch at his home in Albion, Wisconsin, a clump of the Tawny Daylily. He wondered why fruits and seeds never developed on these plants since the flowers had well-developed stamens and pistils. He began studying botany at the University of Wisconsin, and after receiving his B.A. in 1909, he joined the scientific staff at The New York Botanical Garden. He received a Ph.D. in botany from Columbia University in 1913 and remained at the garden

continued on next page

Daylilies *continued*

until 1948. A familiar sight to many people during this time was Stout with a sun helmet on, sitting on a stool, pollinating, tagging, and recording his many daylily crosses. Many of these yielded beautiful and very different cultivars.

Stout eventually found the answer to his question of why *H. fulva* never sets seed. *Hemerocallis fulva* 'Europa' is triploid, that is, it has three sets of chromosomes instead of the normal two sets. Stout determined that it is self-incompatible and that it rarely sets seed even when cross-pollinated. This species spreads vegetatively using its roots and underground stems. Stout gave this plant the name "Europa Daylily" or 'Europa' because it is one subgroup of the *H. fulva* species that propagates itself vegetatively.

Plant explorers, working in Japan and China during the time that Stout was doing his research, sent many known and unknown species of *Hemerocallis* to him. Stout's most important connection was with Dr. Albert N. Steward. Dr. Steward was invited to the University of Nanking in 1921 to teach Botany. He remained there until 1950, and during his stay he sent many *Hemerocallis* species to Stout to be evaluated for use in his breeding. One of Steward's most important discoveries for Stout was *H. fulva* var. *rosea* the first wild pink daylily, which opened up new color possibilities in his breeding. Stout propagated this plant as a clone that he called 'Rosalind'.

The following species were used extensively by Stout in his breeding and will be featured in the new daylily garden. *Hemerocallis citrina*, *H. lilio-asphodelus*, and *H. thunbergii* are all native to China and were used in breeding for their large, fragrant, yellow, night-blooming flowers. *Hemerocallis dumortieri*, *H. middendorffii*, and *H. minor* are all early-blooming dwarf species that Stout used in his crosses. *Hemerocallis dumortieri* and *H. middendorffii* are both native to Japan and have orange flowers, and *H. minor* has bell-shaped, yellow flowers. Another important species is *H. aurantiaca* (also known as *H. fulva* var. *aurantiaca*), which is of uncertain origin, has large orange flowers, and is the only evergreen daylily species. *Hemerocallis aurantiaca* has been used extensively in breeding daylilies for tropical climates. *Hemerocallis multiflora* is native to China and gets its common name, Many-Flowered Daylily, from the 75 to 100 small yellow to orange flowers it bears. *Hemerocallis altissima* is the tallest of the daylily species with the flower stalks reaching a height of 4½ to 6 feet. It has small yellow to orange flowers and blooms from mid to late summer. It was introduced from China by Steward in 1924 and was used by Stout in his hybridizations.

Stout was especially interested in the botany and genetics of his daylilies, but the horticultural importance of his plants could not be denied. Plants and seeds disappeared from his garden due to the overexcitement of many people to his new cultivars. The New York Botanical Garden did not want to handle commercial production of his daylilies so Stout arranged for the Farr Nursery in Wiser Park, Pennsylvania, to evaluate and reproduce the best species and hybrids. They were also given the exclusive right to distribute them, because no one else was interested in handling the plants at that time.

Since Stout's work the increase in popularity of daylilies has been dramatic. The development of tetraploids in the mid-1940s was one of the biggest factors in this increase. Most daylilies have two sets of 11 chromosomes, or 22 total chromosomes. The tetraploids have four sets of chromosomes, or 44 total. They are developed by treating the plants with colchicine, a chemical obtained from the Fall Crocus, *Colchicum autumnale*, originally used in treating gout. The common characteristics of tetraploids that make them so appealing are that the petals are larger and heavier in texture, the flower buds and stalks are thicker in diameter, the colors of the flowers are richer, and the foliage is lusher and a darker green than diploid forms. Tetraploids display a wide array of colors: reds and pinks to melons, yellows from deep golds and oranges to almost white, and purples from pale lavenders to almost black. The only color missing is true blue. The floral lobes (tepals) of certain cultivars are twisted or recurved; others have ruffled, lacy, fluted, or pleated lobes, or the color of their margins may contrast with the rest of the flower. The texture of the entire flower may even vary from satiny and velvet to puckered.

Today there are more than 20,000 cultivars of daylilies, and over 700 new cultivars are introduced per year. Lost among these numerous introductions, Stout's cultivars and many of the original species have almost been forgotten; but many people are beginning to realize the historical value of Stout's cultivars and are discovering the beauty and vigor of some of the original species. ■

VOLUNTEER AWARDS

In 1986 volunteers contributed almost 50,000 hours of service to the Garden. Their dedication and commitment were celebrated on Tuesday, May 12 at Volunteer Evening.

The award for Special Services honors volunteers who have performed research or a special project for their department and was presented to two volunteers who worked on the same project. **Paul McClinton** converted the entire plant records from index cards to a computer beginning in 1983 and finishing in 1986. **Kay Sofian** did the same for orchids, which account for about a third of the total 17,000 records. This was a tremendous, solitary job. The work is slow and requires a great deal of understanding of both plant names and of the computer. This information is very valuable to the Garden and could not have been accomplished without their help.

The Special Services award honors volunteers who have given time above and beyond their normal volunteer commitment. **Bill Satkowski** was chosen to receive this award for his work in the field of safety. Serving as an assistant to John Hancock, our Safety and Security coordinator, Bill not only comes in to the Garden each week, but attends Safety Committee meetings and works at home organizing and cross referencing our material data sheets so they are available to our employees in the shortest time possible.

Leo Noland received the Volunteer Emeritus award for his work with the Production Greenhouse and the Horticultural Answer Service. This award was designed to honor the volunteer who has made a significant contribution, but is no longer active in the program. Leo has been a dedicated and valued volunteer working with plant materials that were used in our many horticultural exhibits. In the early 1970's he spent many hours with the Project Stay Program. This program gave many inner city youths their first actual job experience and because of Leo and others like him we were able to participate.

Two men were chosen to receive the award for Commitment—their contribution was so outstanding the committee

continued on next page

chose to honor both of them.

Bob Buck began volunteering in the Horticultural Answer Service in 1977 and transferred to the Japanese Garden. He now works in the Rose Garden and the Library. His manner and ability have endeared him to all who have worked with him.

Russel Goddard shares this award with Bob for his work at the Arboretum. Russ does an excellent job at the Arboretum. He frequently uses his own tools to get a job done. He has cleared countless numbers of honeysuckle and privet from the Native Wildflower area. He prunes, weed whips and removes fallen trees and branches along the Arboretum's 12 miles of hiking trails.

Volunteers in the Display Greenhouses were recognized for their willingness to pitch in and help with all kinds of tasks from shoveling snow from the entrances in the winter to planting spring annuals. They keep the walks in the Climatron clear and answer visitors' questions, and they do it all with good cheer. The staff relies heavily on these volunteers: **John Goddard, Steven Meyer, Steven Taylor, Dale Boring, Gene Catalano, Albert Edmunson, Kaye Quentin, Lester Aubuschon, Edna Dependahl, Gene Jarvis, Sally Wilson, Adrienne Bieterfeldt, Susie Stark, Warren Tabachik, Becky Balestri and Doris Krueger.**

Guide News

Nancy Thompson, center, was recently elected chairman of the Garden Guides for the 1987-88 tour year. Peggy Abel, right, will assist her as co-chairman and Audrey Allen, left, will schedule all tours. Helen Kuehling, not pictured, will serve as the group's secretary-treasurer.

Currently there are 70 volunteers serving the Garden as Guides; 25 have been actively guiding more than ten years. In 1986 over 17,000 visitors were conducted on one of the special tours offered by the Guides.

Ask the Answer Service

Do you have a plant question? Call the Horticultural Answer Service, Monday through Saturday, 9 a.m. to noon, at ***577-5143.***

Q. My periwinkle ground cover that seemed to be growing so well this spring is suddenly wilting and drying up and the stems are turning black. What's wrong?

A. That sounds like your *Vinca minor* has a stem blight fungus and it is most difficult to control. Dieback may begin on old runners soon after new growth appears. The new shoots quickly cover the old growth, creating a hidden source of infection. Entire clumps of periwinkle may die. The disease is better prevented than cured. Beginning about April, thoroughly soak the stems and soil with the fungicide Benlate and repeat two or three times at monthly intervals. These applications may be necessary on an annual basis. Always read and understand the label directions before applying pesticides.

Q. This time of year my Bluegrass lawn always looks terrible. What can I do to keep it green all summer long?

A. It's not unusual for Bluegrass lawns to look a bit worn at this time of year. Bluegrass (and Fescue) are cool-season grasses that tend to go dormant during hot weather. To keep cool-season lawns looking their best, remember to water often enough to prevent stress. Infrequent thorough soakings every ten days to two weeks will encourage deep root penetration, whereas frequent light sprinklings may cause surface rooting and make the lawn more drought prone. Raise the cutting height of mowers to three inches for Bluegrass and four inches for Fescue. An annual fall fertilization program will keep lawns growing vigorously and better able to withstand summer stress.

Q. I've been pinching back my mums to make them bushy. How long should I continue this practice?

A. Don't pinch hardy Chrysanthemums after the middle of July. You should have fine bushy plants by now and lots of blooms this fall.

Q. I'd like to plant fall vegetables this year. Is there still time to do so?

A. Beans, beets, carrots and turnips can be direct seeded as late as the first week in August. Lettuce, radishes and spinach seeds can be sown as late as the last week in August. Spinach will germinate better if you refrigerate the seeds for one week prior to planting. Broccoli, cauliflower, cabbage and Chinese cabbage plants should be transplanted into the garden about the last week of July. Choosing quick-maturing short-season varieties may allow a little leeway on planting dates.

Q. What is a deep, thorough watering and how do I know I've applied enough water?

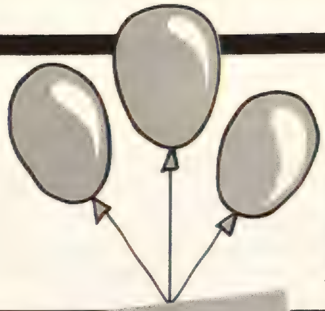
A. A deep thorough soaking is one that penetrates the soil to a depth of four to six inches or more. The best way to tell is to dig a small hole and measure to see how deep the water has soaked. At the same time place an empty can under the sprinkler and measure the amount of water that has collected in the can. You can then be sure water has penetrated to the proper soil depth by measuring the amount of water in the can each time you water.

Q. When is the best time to transplant Iris?

A. Iris is best transplanted in late July or early August. Cut the leaves back to four inches. That will get them out of the way. Lift clumps with a garden fork. Choose healthy growth with a double fan of leaves and a Y-shaped root. Discard any soft, smelly sections or borer-damaged parts. Also discard the old center section. After any cuts callus over, dust with a fungicide such as sulfur and replant with the roots spread out and the tops of the rhizome just barely above ground. Keep well watered until established.

—Chip Tynan, The Answer Service

Don't miss Chip on the KXOK Garden Show (AM 630) each Saturday from 8-9 a.m.



JULY-AUGUST

DAY-BY-DAY

JULY

FOR KIDS' SAKE

Concerts, films, stories, theatre and special exhibits designed with kids in mind will take center stage at the Garden during the entire month of July. This special programming for children is being presented in conjunction with KMOV-TV's year-long "For Kids' Sake" promotion, which is sponsored by McDonald's, Dierbergs, YMCA of Greater St. Louis and Children's Hospital at Washington University Medical Center. For a complete listing of "For Kids' Sake" programs look for the ☼ on the calendar.

NOTE: Education courses listed in the calendar were listed in the *Summer 1987 Courses and Programs* brochure, which was mailed in May and may be filled.

1 ☼
Children's Film Fest
11 a.m. & 1:30 p.m., Wed., Shoenberg Auditorium. First of five films for kids in July. Today's feature is "The Great Mouse Detective." $1 at door, available one hour before showtime.

4-26
Hoya Display
9 a.m. to 8 p.m. daily, Monsanto Hall. Exhibit of popular houseplants known for their waxy flowers. Free.

5
Walking Tour
2 p.m., Sun., Ridgway Center and grounds. Tour of grounds and greenhouses by Garden Guides emphasizing what is in bloom and especially worth seeing at this time of year. Free. Call 577-5140 for reservations.

6
Plant Clinic
9 a.m. to noon, Mon., Ridgway Center. Free diagnosis of insect, disease or nutrition problems with plants (identification of plants also).

8 ☼
Children's Film Fest
11 a.m. & 1:30 p.m., Wed., Shoenberg Auditorium. Today's feature is "The Many Adventures of Winnie the Pooh." $1 at door, available one hour before showtime.

8
Gardener's Walk
6:30 to 8 p.m., Wed., Garden grounds. An in-depth look at the herb garden by the expert horticulturist that cares for it. $7 Members, $10 non-members. Call 577-5140 for information.

8
Shrub Identification
9:30 to 11:30 a.m. or 1:30 p.m. to 3:30 p.m., Wed., Ridgway Center. First of three Wednesday sessions to identify and understand the characteristics of over 50 types of shrubs. $50 Members, $60 non-members. Call 577-5140 for information.

11-19
Cactus Society Show
9 a.m. to 5 p.m. daily (except July 11—1 p.m. to 5 p.m.), Beaumont Room. Exhibit of cacti and succulents by the Henry Shaw Cactus and Succulent Society. Free.

11
Mazes Big and Small
10:30 a.m. to noon, Sat., Ridgway Center. Explore the new Victorian maze. For children ages four to six and their parents. $7 Members, $8 non-members. Call 577-5140 for information.

11
Members' Musical Night At The Garden
7:30 p.m. to 9 p.m., Sat., Spoehrer Plaza. Music under the stars. Members Only. Free. No reservations required.

11
Autograph Party
1 to 3 p.m., Sat., Garden Gate Shop. Richard and Joan Hietzman, authors of *Butterflies and Moths of Missouri*, will be at the Garden to sign copies of their new book and answer questions about Missouri butterflies.

11
A Fish Named Carp
1:30 p.m. to 3 p.m., Sat., Ridgway Center. Explore the wet world of the fish who live in the Japanese Garden lake. For children ages four to six and their parents. $7 Members, $8 non-members. Call 577-5140 for information.

13-17
The Planet Earth
9 a.m. to 3 p.m. daily, Ridgway Center (field trips to Shaw Arboretum and the St. Louis Science Center). A fascinating look at our planet and how it works, designed for children 10-13 years-of-age. $65 per person. Call 577-5140 for reservations.

15 ☼
Children's Film Fest
11 a.m. & 1:30 p.m., Wed., Shoenberg Auditorium. Today's feature is "The Great Muppet Caper." $1 at door, available one hour before showtime.

15
Shrub Identification
Please see July 8 for details.

17 ☼
Cotton Candy Concert
2 p.m., Fri., Spoehrer Plaza. First of three concerts geared for children in July. Starring The River City Ramblers Dixieland Band and their presentation of "Dixieland, St. Louis and the River." Free. Cotton candy will be sold. A Young Audiences program.

18 ☼
Children's Theatre
2 p.m., Sat., Shoenberg Auditorium. "All Aboard the Freedom Train" production for elementary school level children on the trials and triumphs of Harriet Tubman and the underground railroad. Presented by St. Louis Black Repertory Theatre. $1 at door, available one hour before showtime.

18
Jack and The Beanstalk
1:30 p.m. to 3:30 p.m., Ridgway Center. Explore the legume family. For children ages four to six and their parents. $7 Members, $8 non-members. Call 577-5140 for information.

20
Plant Clinic
Please see July 6 for details.

22 ☼
Children's Film Fest
11 a.m. & 1:30 p.m., Shoenberg Auditorium. Today's feature is "Lady and the Tramp." $1 at door, available one hour before showtime.

22
Shrub Identification
Please see July 8 for details.

24 ☼
Henry Shaw's Birthday Celebration
10 a.m. to 3 p.m., Ridgway Center and grounds. Continuous "party" for the young at heart in celebration of Garden Founder Henry Shaw's 187th birthday. Free.

24 **Cotton Candy Concert**
2 p.m., Fri., Spoehrer Plaza. Second of three concerts geared for children in July, starring the Young Audiences Folk Quartet/Spatz and their presentation of "Just Plain Folk." Free. Cotton candy will be sold. A Young Audiences program.

25 **The Tree and Me**
10:30 a.m. to noon, Ridgway Center. A pre-school Henry Shaw Academy course where children explore how trees and people are alike and how they are useful to each other. $7 Members, $8 non-members. Call 577-5140 for information.

25 **Dragons and Other Flavors**
1:30 p.m. to 3:30 p.m., Ridgway Center. Explore the exotic world of dragons and spices. For children ages four to six and their parents. $7 Members, $8 non-members. Call 577-5140 for information.

27-31 **Puzzles of Life**
10 a.m. to 3 p.m. daily, Arboretum Visitor Center and grounds. Discover the puzzles of life and how they fit together by exploring forests, fields, creeks and ponds. Designed for children 7-9 years-of-age. $65 per person. Call 577-5140 for reservations.

28 **Folktales From Around The World**
11 a.m. to 3 p.m. (sessions begin on the hour), Tues., Ridgway Center. Continuous storytelling sessions featuring folktales and legends from England, Germany, Africa, America and other countries. For pre-school to 10 year-old children. Presented by the St. Louis Gateway Storytellers. Free.

29 **Children's Film Fest**
11 a.m. & 1:30 p.m., Wed., Shoenberg Auditorium. Today's feature is "Sleeping Beauty." $1 at door, available one hour before showtime.

31 **Cotton Candy Concert**
2 p.m., Fri., Spoehrer Plaza. Last of three concerts geared for children in July, starring the St. Louis Ragtime Trio and their presentation of "Scott Joplin: From Rags to Riches." Free. Cotton candy will be sold. A Young Audiences program.

The "good luck" dragon and his crazy antics is expected to make an appearance at the 12th annual Japanese Festival at the Missouri Botanical Garden August 29 - September 7.

AUGUST

1 **Members' Early Morning Stroll**
5:30 a.m., Sat. An early morning treat. Sunrises at 6 a.m. For "Early Bird" Members who "rise and shine." Sleepy heads need not apply. Free. No reservations required.

1 **Iris Society Sale**
10 a.m. to 5 p.m., Sat., Ridgway Center. Annual Greater St. Louis Iris Society rhizome sale to benefit the Garden. Free.

1 **Members' Early Morning Stroll**
(details will be forthcoming)

1-23 **Tree Exhibit**
9 a.m. to 8 p.m. daily, Monsanto Hall. "Old Trees, the Art and Science of Tree Form and Tree Rings" is an exhibit of detailed drawings of 300 – 1,000-year-old eastern red cedar trees from the Ozark region and a display of actual cross sections of trees with ecological interpretations. Free.

2 **Walking Tour**
2 p.m., Sun., Ridgway Center and grounds. Tour of grounds and greenhouses by Garden Guides emphasizing what is in bloom and especially worth seeing at this time of year. Free. Call 577-5140 for reservations.

3 **Plant Clinic**
Please see July 6 for details.

5 **Gardener's Walk**
6:30 to 8 p.m., Wed., Garden grounds. In-depth look at the Swift Family Garden led by the expert horticulturist who cares for it. $7 Members, $10 non-members. Call 577-5140 for information.

12 **Gardener's Walk**
6:30 to 8 p.m., Wed., Garden grounds. Close look at the Scented and Hosta Gardens led by the expert horticulturist who cares for them, $7 Members, $10 non-members. Call 577-5140.

17 **Plant Clinic**
Please see July 6 for details.

29 **Japanese Festival**
Runs through Labor Day: 9 a.m. to 10:00 p.m. on Aug. 29 & 30 and Sept. 3-6, and 9 a.m. to 8 p.m. on Aug. 31 and Sept. 1, 2 & 7, Ridgway Center and grounds. 12th annual salute to the culture of Japan with this year's theme of "The Living Treasures of Japan," featuring the performing arts, food, music, visual arts and crafts and more. Admission to the Festival on weekends and Labor Day is $3 for adults, $1 for senior citizens and free to children 12 and under. Admission during the week is $2 for adults and free to senior citizens and children 12 and under.

FROM THE MEMBERSHIP OFFICE

Garden Celebrates 20,000th Member

Allison and Matthew Hile get a carriage ride with "Henry Shaw" through his Garden.

The Missouri Botanical Garden reached a new peak in its development with the signing of its 20,000th Member of the Garden. On Wednesday, April 29, Allison and Matthew Hile became Members of the Garden and were surprised by the events that immediately followed... 'Henry Shaw' himself stepped from the Orientation Theatre to greet and congratulate them. Mr. Shaw began bestowing gifts on the young couple, who live in the Tower Grove neighborhood. The Hiles became lifetime Members of the Garden with their new gold membership cards. In addition, they received a basket of Mr. Shaw's private label wine and freshly baked bread from the Gardenview Restaurant, a porcelain Boehm Henry Shaw Rose, as well as tickets to Rose Evening and Mr. Shaw's upcoming birthday party. Then, the best treat of all! A ride with Mr. Shaw through the Garden on his flower-laden carriage.

It was certainly a day the Hiles will not forget and a magnificent milestone for Missouri Botanical Garden.

THE FLOWER FUND

Most of you who visit the Garden from time to time are aware of the beautiful displays of flowers that are provided for the visitors each season—the perennials, such as irises, daylilies, peonies and hostas; favorite bulbs, such as tulips and narcissus; flowering trees and shrubs like roses and azaleas; and many annuals as well.

The Garden's Flower Fund is designed to assist in funding our floricultural operations. A gift to this fund will help in the purchase of seeds, plants and bulbs, the care of these seedlings, planting, fertilizing and designing—all the behind-the-scenes magic necessary to turn the Garden into a flower wonderland.

Here's how you might use this fund: Are you celebrating an anniversary? Does someone you know have a birthday? Your neighbor had a baby? If you have a special occasion you want to recognize, call the Garden at 577-5118, where one of our office staff or volunteers will assist you with your request. For your contribution of $25 or more, we will send a card acknowledging your thoughtful gift.

Remember—the Flower Fund is a wonderful way to remember someone special and have everybody enjoy it. A gift of flowers to last a whole season!

Botanical Garden Subdistrict Elects Officers

The Botanical Garden Subdistrict Commission of the Metropolitan Zoological Park and Museum District elected the following commissioners as officers for 1987-1988 at the annual meeting on May 5, 1987: Mrs. Pamela Shephard, Chairman; Mr. Walter G. Stern, Vice-Chairman; Mrs. Marjorie M. Weir, Treasurer; and Mr. George H. Walker III, Secretary.

RARE OPPORTUNITY A SUCCESS

"A Rare Opportunity," the plant sale and auction that helped clear the way for the construction of the Garden's new greenhouses, was a fun and profitable evening. Hundreds of people gathered to experience the plant purchases of a lifetime on Friday evening, April 10. The sale featured wonderful bargains on a variety of Garden-grown plants. The auction presented a marvelous opportunity to acquire unique plant specimens and horticultural services never before offered by the Garden. Bruce B. Selkirk Jr., officiated and added his charm and expertise to a very fun event.

With profits of nearly $25,000, the horticulture department will be well-equipped to restock the greenhouses upon completion. "A Rare Opportunity" was certainly a unique way to have fun and serve a good cause as well.

Famous-Barr Salutes the Garden

A celebration of fragrance and flowers was the theme of Famous-Barr's "Salute to Missouri Botanical Garden." The week-long celebration, which began on May 3, took place at Famous-Barr's downtown store. Famous replicated the various types of gardens at Missouri Botanical Garden throughout the first floor fragrance department. This presented a magnificent live floral backdrop for week-long activities at the department store. Almost 1000 Garden Members joined the celebration on Sunday and enjoyed live music, floral demonstrations and a chance to meet their favorite gardening columnist. A Garden member, Frances L. Hartman of Granite City, was the winner of a 1988 visit to the Chelsea Flower Show in England. Famous-Barr also gave Garden memberships to 14 lucky shoppers throughout the week.

Famous-Barr deserves a wealth of appreciation for honoring the Garden in such a grand fashion! Thank you!

Arbor Day

About 200 little hearts belonging to Daddy (or that special someone) attended Arbor Day on April 11. Entertainment included storytelling, a tree search, carp feeding, movies, a "bark burger" (alias hot dog) lunch and a tree seedling to take home for planting.

Children entered their Dads in the "Special Dad" drawing. The winner, Kip Franco, and his father, Dennis, received a Sunday brunch at the Gardenview Restaurant and Cardinal baseball tickets.

Behind the Scenes

Pat Rich Resigns

Patricia E. Rich, director of planning and development at the Garden, has resigned her position, effective July 1. She has formed her own consulting firm, Patricia Rich Associates, which will provide long-range strategic planning and organizational development services.

She joined the Garden in April, 1981 and has served the Garden in a variety of roles including managing the construction of the Ridgway Center, developing a planning strategy for the staff and Members' Board and expanding the Garden's fundraising activities.

Two of her clients are the Garden, where she will continue her work in strategic planning and the Organization for Tropical Studies (OTS), a consortium of research institutions with research facilities in Costa Rica. Garden Director Peter Raven is the current President of OTS.

A search is presently underway to find a replacement. Rich will remain at the Garden until a new director of development is hired and trained.

IN MEMORIAM

Dr. Robert W. Schery

Dr. Robert W. Schery, botanist and conservationist, died at his home in Marysville, Ohio, on March 18. A nationally recognized lawngrass and turf authority, lecturer and consultant, Dr. Schery was the founding Executive Director of The Lawn Institute. He retired in 1982.

Dr. Schery was a native of Missouri, having been reared in the St. Louis area. He completed studies in botany at Washington University and conducted graduate research leading to the Ph.D. degree at the University and at the Missouri Botanical Garden.

He traveled throughout the United States and the world and was co-editor of "The Flora of Panama," which appeared in the *Annals of the Missouri Botanical Garden*. He was author or co-author of several books, including *Plants for Man, Plant Science, Plant Agriculture, The Lawn Book, A Perfect Lawn, The Householder's Guide to Outdoor Beauty,* and *Lawn Keeping*. Research projects involving economic botany and popular horticulture have resulted in the publication of several hundred magazine and journal articles.

Dr. Schery had been a member of the teaching and research staff of Washington University, senior technician for the Rubber Development Corporation, lecturer at the University of Wisconsin and botanist for the Monsanto Chemical Company and for the O. M. Scott Company.

From the Garden Gate Shop

Japanese Festival Week at the Garden Gate Shop: August 29—September 7

To help celebrate this week the Gift Shop is stocking paper and silk fans, parasols, fabulous windsocks and kites, origami paper, hand drums, and a vast array of Japanese gardening books.

In the Plant Shop you will find oriental style Bonsai plants and pots, Japanese tools and lanterns plus bronze bells. Please stop by to see all our Japanese selections.

Note to Members: The Plant Shop now has available for special order genuine Teakwood garden furniture. Gift certificates are always available in the Garden Gate Shop.

Book Review: Butterflies & Moths of Missouri

The newest addition to the Garden Gate Shop's numerous books on the natural history of Missouri is *Butterflies and Moths of Missouri* by Richard and Joan Heitzman (Missouri Department of Conservation, $12.50). Illustrated with over 800 color photographs, this guide describes over 300 species of butterflies and moths common to Missouri and other midwestern states. An excellent field guide, it discusses each family of lepidoptera, describing the larval stages and feeding habits of each species.

Mr. Heitzman is a widely recognized expert on lepidoptera and this book is expected to be the definitive field guide on Missouri butterflies and moths. Therefore, we are very pleased to announce that the Heitzmans will be at the Garden Gate Shop on Sunday, July 12 from 1:00 to 3:00 p.m. to sign copies of their book and to answer your questions about Missouri lepidoptera. We hope you will join us.

Dr. Nancy Morin, director of the Flora of North America project

Garden Center for Major Scientific Project

The Missouri Botanical Garden is launching a major project to catalog the plants of North America north of Mexico. The project, called Flora of North America, will, for the first time, provide full descriptions and range distributions for the plants of the United States, Canada, Greenland, Saint Pierre and Miquelon. Completion of project is expected to take 12 to 13 years.

Dr. Nancy Morin, director of the Flora of North America project, said the project will provide information needed by conservationists, land managers, agriculturists, health scientists and biologists. "It is remarkable," Morin said, "that such a work has never existed for North America, although similar publications are available for the U.S.S.R. and Europe, and are in process for the People's Republic of China and Australia."

Morin attributed the new interest in the project to an increased awareness of the importance of conserving genetic diversity and of protecting rare and endangered organisms.

Initial planning for this project began in 1982 and has been carried out by a consortium of institutions. The Missouri Botanical Garden serves as the organizational center, and editorial committee members are stationed throughout the United States and Canada.

The Flora of North America will eventually be available both in publication format and as a computerized data base. The first volume, containing information on ferns, conifers and their relatives, will be completed in 1989. The final volume is expected in the year 2000.

Administrative development of the project is funded by the J. N. Pew Jr. Charitable Trust, one of the Pew Charitable Trusts. The Pew Charitable Trusts, which are based in Philadelphia, consist of seven individual charitable funds established between 1948 and 1982 by the sons and daughters of Joseph N. Pew, founder of the Sun Oil Company. The Trusts support nonprofit organizations dedicated to improving the quality of life for individuals and communities. Grants are awarded in the areas of conservation, culture, education, health sciences, human services, public policy and religion. The Missouri Botanical Garden was awarded $100,000 for 1987 and $100,000 contingent on the project raising an additional $200,000 for in 1988.

Participating institutions include: National Museums of Canada, University of Ottawa, University of Montreal, University of Alberta, University of Western Ontario, University of Alaska, University of California, Carnegie Mellon University, Carnegie Museum, Harvard University, Jacksonville State University, Kansas State University, Northern Kentucky University, New Mexico State University, University of Oklahoma, University of Texas, Utah State University, and University of Wyoming.

Garden Botanists Receive Funding for Documenting Flora of Costa Rica

Missouri Botanical Garden botanists Michael H. Grayum and Barry E. Hammel have received a $65,000 grant from the National Science Foundation for the first year of a ten-year project that will culminate in a two volume "Manual to the Plants of Costa Rica."

Costa Rica is known for its large and exemplary system of national parks and reserves, and annually hosts thousands of natural history tourists and tropical botanists. As in many tropical countries, however, the flora is very diverse but still poorly known.

This will be the first comprehensive treatment of the country's rich flora, published in an accessible format—compact, economical and in Spanish initially—to meet the urgent needs of conservation and resource managers. It will also be a much needed reference for the many visiting and resident students of biology in Costa Rica.

Grayum and Hammel, both assistant curators at the Garden, will coordinate intensive surveys of four particularly diverse areas: Rincón de La Vieja; Tortuguero; Braulio Carrillo; and Corcovado. They will be working closely with the Museo Nacional de Costa Rica and will have the collaboration of several other Costa Rican institutions including the Fundación Neotropica, the Fundación de Parques Nacionales, the Ministerio de Recursos Naturales, Energía y Minas, and the Costa Rican-based Organization for Tropical Studies.

Garden Scientist Authors Book

"The Moreas of Southern Africa," a fully illustrated monograph researched and written by Missouri Botanical Garden scientist Dr. Peter Goldblatt, has been published and released for distribution.

The publication culminates over 15 years of work by Goldblatt, the Missouri Botanical Garden's B. A. Krukoff Curator of African Botany since 1975. Goldblatt was born in Johannesburg, South Africa, and received his Ph.D. from the University of Cape Town, South Africa.

It is the first volume of the "Annals of the Kirstenbosch Botanic Gardens" which seeks to document southern African flora. The Kirstenbosch Botanic Gardens is in Cape Town, South Africa. Financial support for the research and field work was largely provided by the National Science Foundation.

Co-sponsored by the Missouri Botanical Garden, the monograph is a systematic study of the genus *Moraea*, a member of the plant family Iridaceae. The genus is sometimes referred to as wild irises, and there are 103 species found in southern Africa. The Missouri Botanical Garden is the designated center in North America for the study of African botany.

Trustee Profile

ROBERT E. KRESKO

One of the busiest members of the Garden's Board of Trustees lately must be Robert E. Kresko, the current chairman of the Campaign for the Garden Steering Committee. No stranger to fund raising, he served as chairman of the Henry Shaw Fund Committee (annual giving) from 1983 to 1985 and as co-chairman in 1982. He also assisted in the capital fund drive for the Ridgway Center.

Mr. Kresko is National Managing Partner of Trammell Crow Company, a major commercial real estate developer and management company with over 63 offices nationwide. A graduate of Brown University, he also served in the Marines. He grew up in South St. Louis and lived for a time right after his marriage to Dorthea Nelle Kresko on Botanical Avenue near the Garden. He currently lives in Ladue.

He has been a member of the Board of Trustees since August, 1981, though his involvement with the Garden goes back until at least 1970. He is also on the board of directors of Krombach and Associates, Centerre Trust Company and the St. Louis Regional Commerce and Growth Association.

Plant Talk From the Gardenview Restaurant

Rice

FOOD FACTS:

Mention Chinese food and many people will immediately picture bowls of steaming hot rice. Rice is often considered to be the staple of the Chinese diet and rightly so. Domesticated more than 4,000 years ago in India, *Oryza sativa* (rice), is now the main source of calories and protein for most of Asia.

Rice, a member of the grass family, is one of the two most important cereal crops in the world, the other being wheat. Current annual production of rice is over 350 million metric tons, with the bulk of cultivation found in mainland China, India, Indonesia, Bangladesh and Japan. Very little of this rice ever undergoes world trade, as it is usually consumed within the producing country. The United States produces a small amount of the world's rice with the annual yield over 4 million metric tons.

Well suited to the Asian climate, rice was originally a swamp plant. Today rice farmers imitate the growing conditions of a swamp with seasonal flooding of rice beds, commonly called paddies. Levees are built in fields to retain flood waters and in some areas terraces are built into hillsides to make space for cultivation. Just after the rice is planted, the farmers begin flooding the paddy. In ideal conditions a field will be slowly flooded to a peak of 12 inches of water just before the plants mature. Then the fields are drained.

In areas where the climate does not provide enough rainfall, rice is grown to seedling size in greenhouses and transplanted to paddies. Before transplanting, the rice workers prepare the fields by working it while it is wet. This creates puddles and is done to stop water drainage and to kill weeds.

The rice that is grown by today's farmers is much more efficient than rice that was grown just 50 years ago. This is due to the green revolution and improvements derived from rice breeding.

Improvements have been made over the original strain of rice commonly grown in Asia called Indica. Indica was selected for its adaptability to low soil fertility and monsoon agriculture. Today's breeders have developed strains of rice that are drought resistant and produce high yields. The most promising is called IR-26, which combines the best characteristics of disease resistance and high yield.

The nutritional value of rice is high and can be measured by the ratio of grams of protein per 100 calories. To maintain a state of health, an average person should consume 2,500-3,000 calories per day and 40 to 60 grams of protein. Plants that provide over 2 grams of protein per 100 calories are considered efficient. Rice has a protein score of 6.7.

This is important when one considers that plants provide 88 percent of the calories and 80 percent of the protein needed by the world's people. Animal protein is expensive and is only consumed in quantity in industrialized nations. Rice is an efficient means of providing necessary protein and calories to over half of the world's people.

FOOD TIPS:

Gohan (fluffy boiled rice)

1 cup rice (do not use pre-cooked rice)
2½ cups cold water
½ teaspoon salt

Place rice in deep saucepan with a tight fitting lid. Add water and salt. Place over high heat and bring quickly to a full boil. Reduce the heat to the lowest setting and let rice simmer about 25 minutes. Turn off heat and let rice stand 5 minutes or longer. Never remove cover until time to serve.

Kids' Tip

Wouldn't to be fun to eat your food in the eastern manner with chopsticks? Test your finger dexterity by using chopsticks the proper way. Place one stick in the V formed by the thumb and first finger and press it against the end of your third finger. This chopstick remains stationary. Place the second chopstick between the thumb and first finger and open and close it with the tip of your second finger. It helps if you think of your chopsticks as a pair of tongs. You may want to practice picking up some non-food items first. Styrofoam "peanuts" make good targets. Good luck!

For Younger Members

Preserving Food

What did you have for supper last night? Chances are you enjoyed a meal with your family that included summer fruits and vegetables. During the summer we have a wealth of fresh foods. But in a few months our vegetables will be frozen or canned.

Because we live in the northern hemisphere, our growing season is May through September. As we approach fall the days get shorter and the hours of darkness increase. Our plants have adapted to this cycle in a way that allows them to have a period of growth in summer and a period of rest in winter. When the plants rest we say they are dormant.

During the dormant season plants are not growing or producing food. These days we don't worry about that too much. In the winter we just reach in the freezer and pull out frozen vegetables or go into the pantry and grab a can of corn. But imagine what it would be like if you were a boy or girl who lived 1000 years ago. 1000 years ago, the Indians lived by hunting. In some tribes the women were farmers. Children helped collect food by scavenging berries and fishing. Late in the summer they were already preparing for the coming winter.

The Indians stored food in two main ways. These were drying and smoking. Fruits and vegetables were set out in the summer sun and dried. This removed the moisture and protected the food from mold and bacteria. It also made foods easy to store because the loss of water would shrink the food. Smoking was used to preserve the meat. Some buffalo was smoked and perhaps some deer and fish were also prepared for the winter. Smoked food was dried over a fire. The meat soaked up the smoke and this kept out microscopic organisms.

As a young Indian, you would have eaten your dried meat and dried vegetables during the winter. Often you might not have enough food stored to make it through the winter. By the time spring arrived you might have been getting pretty hungry.

As you can see this was not the easiest way to live through the dormant season of the year. Many inventions have helped us solve the problem of summer plenty and winter fast. One of these inventions was the method of food preservation called canning. This was invented by a man named Nicoas Appert in 1809. He needed a way to feed Napolean's army, so he put food into a sealed container, heated it in boiling water and found that it did not spoil until it was opened. Canned foods are still used today and can be saved for several years.

Sailors who spent many months on the ocean also needed a way to keep food and they invented the food preservation method called salting. They used a mixture of ocean salt water and vinegar to soak their food. This was called brine.

Pickling is another way to prevent food from spoiling and to help people have food all year round instead of just in the summer months. Foods are pickled by soaking them in a vinegar solution. This has so much acid in it that microorganisms cannot live there. Some vegetables that are pickled are beets, carrots, cauliflower, beans, and peppers. Many people even eat pickled eggs!

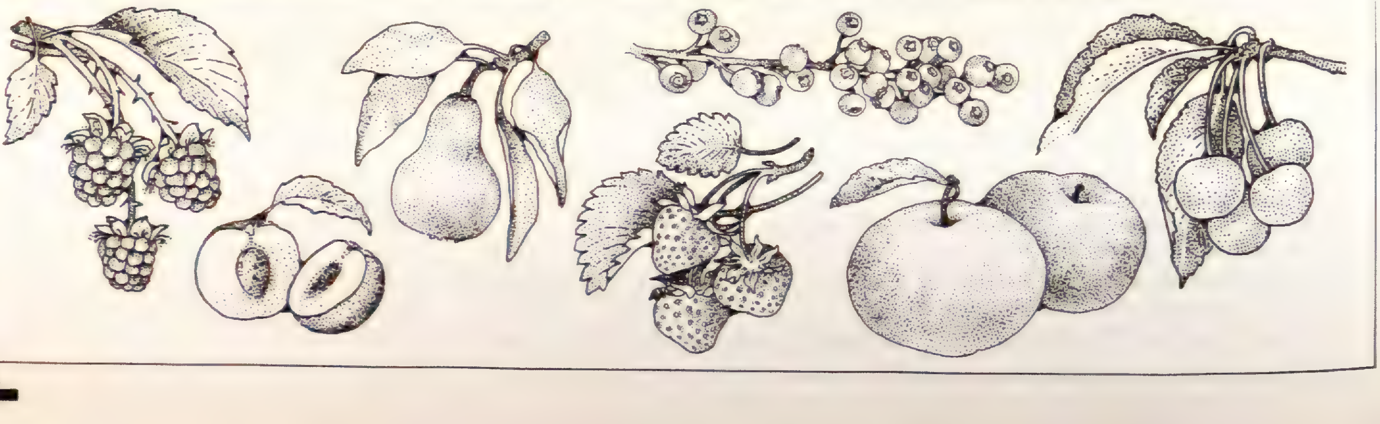
The modern methods of food preservation include refrigeration, freezing and freeze drying. Freeze drying is the newest addition to the preservation line. This is done by a combination of freezing food and exposing it to a vacuum. Meats, vegetables and even coffee can be freeze dried and stored for long periods of time.

The next time you eat one of those nice fresh vegetables or fruits think about how you might eat it in the winter. Will it be canned, frozen, dried or pickled? You can even practice preserving your food as the Indians did. Listed on this page are instructions for making your very own fruit jerky. If you are patient and dry it properly your fruit can be used as a summer snack or in a fall pie.

PROJECT

Fruit Jerky

1. Select your favorite ripe fruit. Some good ones to use are apples, pears, peaches, apricots, cherries and plums.
2. Wash, peel if desired, and remove seeds.
3. Cut food into chunks and place in food chopper or blender until a thick purée is formed. Add ½ cup of sugar to act as a preservative. (For light colored fruit add a tablespoon of lemon or lime juice, too.) Drain off excess juice.
4. Line a cookie tray with wax paper.
5. Pour your purée onto a cookie sheet about ¼ inch deep.
6. Place your tray in a sunny southern window and allow the sun to dry your mixture. (It dries faster without air-conditioning.) The drying will take two or three days.
7. When properly dried, the fruit will be sticky to the touch but can be pulled easily from the wax paper.
8. Peel off the paper, cut into strips and enjoy your fruit jerky.



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continued on next page

Raven Elected Officer of National Academy of Sciences

Garden Director Dr. Peter H. Raven has been elected home secretary of the National Academy of Sciences (NAS), effective July 1, 1987, through June 30, 1991. Raven's election was one of six offices filled recently by the 1,500-voting member Academy.

"My election as home secretary to the National Academy of Sciences is one of the highest honors that I have received," said Raven. "I'm especially excited because of the importance of the work the Academy does in making recommendations to the federal government on science and technology."

As home secretary, Raven will oversee membership affairs and will also serve as principal administrative officer for the Academy Council. Raven has been a member of the NAS since 1977 and currently serves as chairman of the National Research Council's (NRC) Committee on Research Opportunities in Biology. The NRC is the principal working arm of the NAS.

The Academy was established in 1863 by Act of Congress as a private, nonprofit, self-governing membership corporation for the furtherance of science and technology, required to advise the federal government upon request within its fields of competence.

Recent studies for the federal government by the NAS, via the National Research Council, concluded the following: children and spouses of smokers are at greater risk for lung ailments than those of non-smokers; a massive, nationwide public education and research effort against AIDS (acquired immune deficiency syndrome) is needed now if the U.S. is to prevent the current epidemic from becoming an even greater "catastrophe"; more aggressive programs to reduce the number of unintended pregnancies, abortions, and births to teenagers are needed; and improved controls on the export of militarily sensitive technology are recommended.

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AUGUST 29–LABOR DAY

12TH ANNUAL JAPANESE FESTIVAL

This year's festival theme is the "Living Treasures of Japan." The festival will focus on the art and artists called ningen kokuho, or Living National Treasures. Since 1950, 37 persons representing 31 crafts and seven groups in the handcraft field have been given this honored designation by the government of Japan. In addition to kabuki, pottery, koto, classical dance, dolls, and drums, the Garden is honored to host 91-year-old Unichi Hiratsuk, the world's foremost woodblock artist. He has been named one of Japan's Living National Treasures. But these visual and performing arts represent just a portion of what will be available for your enjoyment.

- **FIRST WEEKEND**
  August 29 & 30
  St. Louis premier of San Jose Taiko Drummers, evening performances by the Chusei Koto Society, martial arts, kendo demonstrations, candlelight walks.

- **MONDAY/Journey to Japan**
  Tours of the Japanese Garden, travel lectures, slides and films.

- **TUESDAY/Art & Artisans**
  Demonstrations of arts and crafts including pottery, calligraphy, fanmaking, origami, hari-e, kumihimo, dollmaking and more.

- **WEDNESDAY**
  Lifestyle & Design
  Traditional fashions, Shiseido cosmetics, cooking, Ikebana, interior design.

- **THURSDAY/The Natural World**
  Gingko tree lecture and walk, bonsai lecture and sale, tea ceremony, tours of Teahouse Island and Seiwa-En, candlelight walk.

- **FRIDAY/Children's Day**
  Magic, Suzuki flutes, candy man, workshops, dance, taiko drums, candlelight walk.

- **LABOR DAY WEEKEND**
  September 5, 6, 7
  Combined evening performance of Taiko Dojo drummers, martial arts, magic, koto music, kabuki, candlelight walks and more!

Festival Hotline opens Monday, August 24.
Call 577-5198 for details.

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Missouri Botanical Garden

BULLETIN

VOLUME LXXV, NUMBER 6 SEPTEMBER-OCTOBER 1987

New Sculpture Garden

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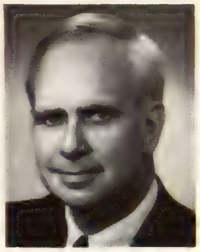
Halfway Home



I am delighted to report that the Campaign for the Garden has passed the halfway mark. A recent very generous contribution from the McDonnell-Douglas Foundation and its Employee Charity and Community Services Plan of St. Louis put us over that important point. Corporate support for the Campaign has been exemplary; major gifts have also come from Monsanto, Emerson Electric, Anheuser-Busch and Southwestern Bell as well as a number of other companies. Very important also has been trustee support, especially that of Harriet Spoehrer, and that of several additional major donors.

The tangible results of the Campaign can be seen in the new greenhouses that are going up, providing additional and better space for plant production. The engineering work and interior planning for the Climatron continues as does the final planning work on the Center for Home Gardening. For a preview of what is in store for the Climatron, be sure to see the story on page 8.

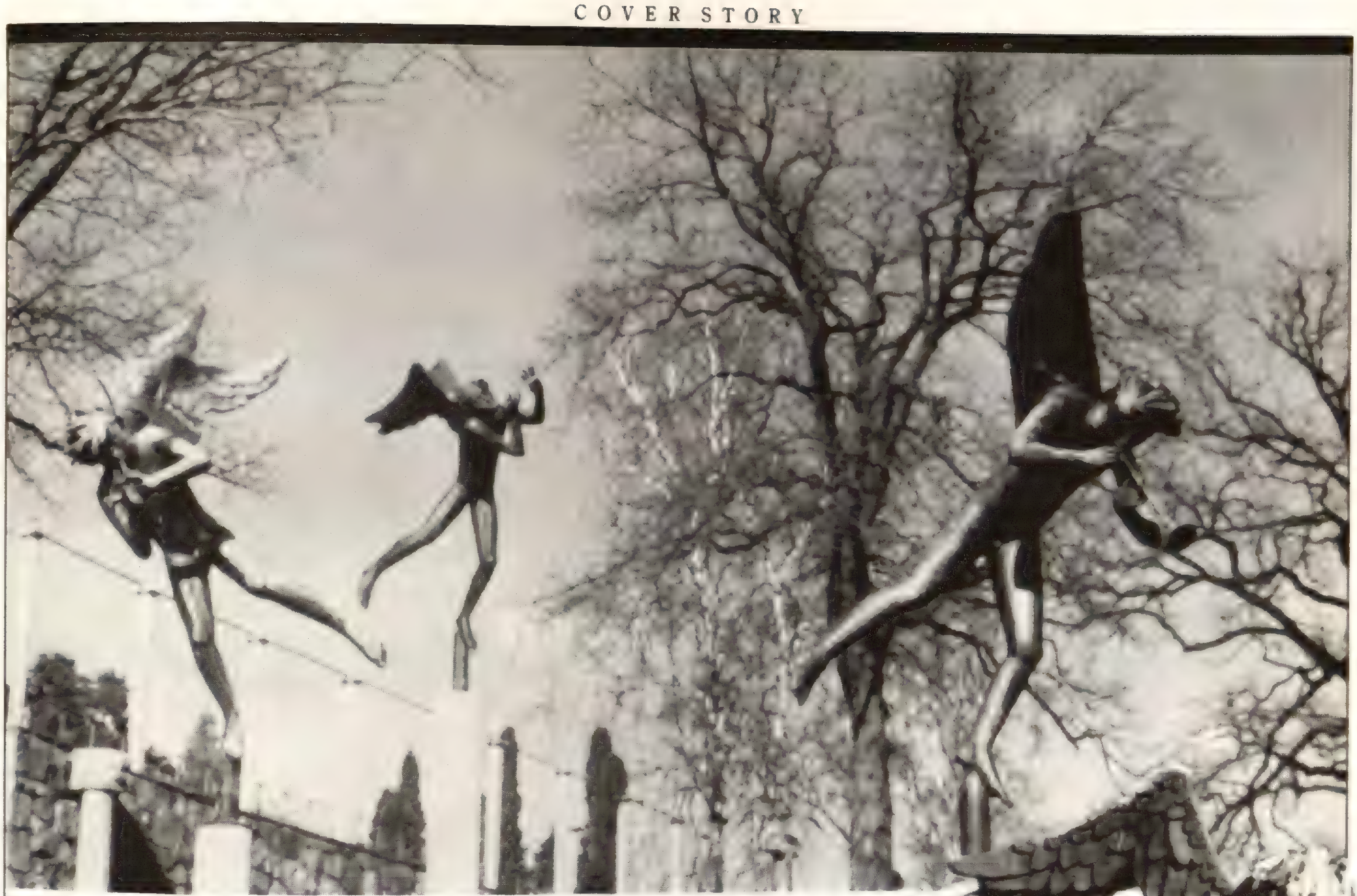
While we have reached this fund raising milestone, there is much yet to be done to raise the rest of the funds necessary for all of the Campaign projects, projects that will enable the Garden to serve the community at a high level into the next century. The trustees, many campaign volunteers and I look forward to working with Garden supporters at all levels who will make possible the exciting future ahead.

Peter H. Raven

The Unseen Garden

From time to time in the *Bulletin*, we have attempted to give you a glimpse of what botanical research at the Garden is all about. Soon Garden Members will be receiving in the mail a beautiful new booklet, *The Unseen Garden*, describing in detail the Garden's world-famous research program and the people involved. Several years in the making, *The Unseen Garden*, puts the work being carried out by Garden scientists into perspective.

VOLUNTEERS HONORED: On Thursday, June 11, thirty-one volunteers with ten or more years of service were recognized at a luncheon given in their honor. Pictured above is Lucille Gausch (left), a 30-year volunteer, who is now a tour guide in Tower Grove House, Director Peter Raven, and Charlotte Mandel, a volunteer for 26 years as a member of the Herb Society. Not pictured is Mary Edna Wenzel, a 45 year Garden volunteer, who now serves on the Historical Committee of Tower Grove House.



NEW SCULPTURE GARDEN

By George McCue

The always high expectations of visitors to Shaw's Garden have been focused in recent weeks on the historic former entrance area within the Flora Gate. Visitors have been detoured around this zone lately to make way for comprehensive renovation, and now it has been made known by Director Peter Raven that when the lily pools and the walkways are restored, they will become the setting—by next spring—of seven large bronze sculptures by Carl Milles.

The name of the Swedish sculptor has been a household word in St. Louis since 1940, when his famous fountain in Aloe Plaza opposite Union Station was dedicated. Formally identified as *The Meeting of the Waters*, that great composition in bronze, water, and civic space is generally known in this region simply as the Milles Fountain. The Milles figures to be placed in the Missouri Botanical Garden, representing several phases in his years of production, will contribute to the notability of St. Louis as a center of his art.

When the Garden's lily pools reappear they will be in their familiar configurations—rectangular adjacent to the Flora Gate and the Climatron, with a broad circular basin as the central element. The flanking walks and planting beds will be broadened symmetrically on the north and south sides into a nearly square plaza, affording both intimate and panoramic vistas of the new sculptures and their setting.

The new plan will provide sites for future art in keeping with the program, inaugurated by founder Henry Shaw, of enhancing the visitors' experience of the garden environment through the medium of sculpture. With installation of the Milles figures this will be identified as the Sculpture Garden.

In the installation designed by Geoffrey Rausch of Environmental Planning and Design, Inc., the Garden's master planners, the new Milles pieces will be placed in all three basins at various heights above the water.

The group *Two Girls Dancing*, the earliest work in the ensemble, is intended for the basin nearest the Climatron. It was modeled in 1914, reworked for casting in bronze in 1917, and exhibited in the 1930 Functionalist Exhibition in Stockholm. Since then the first cast has been in the Millesgården at Stockholm.

In the circular center basin will be *Three Angel Musicians* of 1949-50, elevated above the water surface on tall granite columns. They

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Top: Three Angel Musicians (c. 1949-1950)

Above: Angel Musician with Flute

On the cover: Detail, Angel Musician with Pan-Pipe

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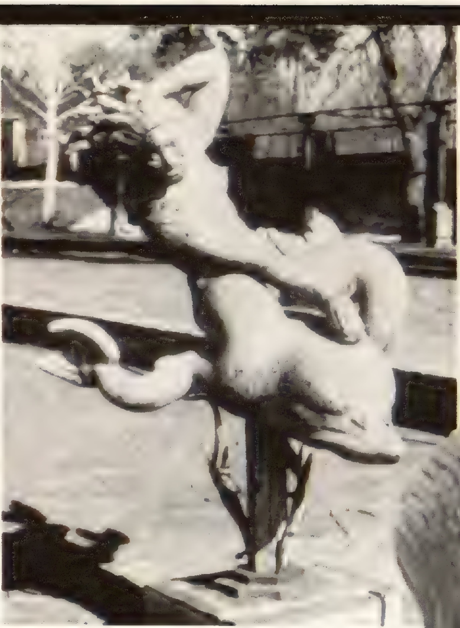
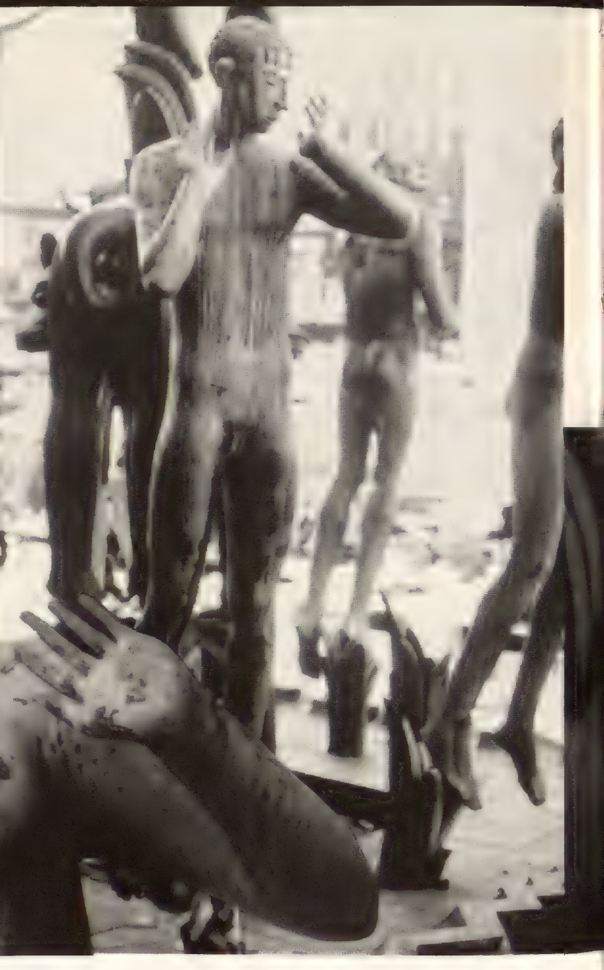
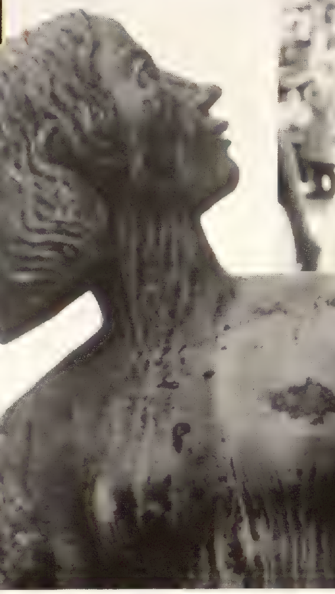


▲
Sunglitter (1918)



Orpheus Fountain Figure (Male, 1936) ▶



Detail, Orpheus Fountain Figure (Female, 1936) ▶

NEW SCULPTURE GARDEN

continued

were done, with 35 other figures, for the Fountain of Faith in National Memorial Park, Falls Church, Virginia, on the theme of reunion after death. The angels, lightly poised with the effect of hovering in midair, play a flute, a pan-pipe, and a horn.

Two figures from the Orpheus Fountain of the Stockholm Concert Hall will stand in the basin near the Flora Gate. In the complete group at Stockholm these are among eight figures roused by the power of music who surround the towering figure of Orpheus. The composition was completed in 1936.

Also to be in the Flora Gate basin is one of the sculptor's most charming and spirited works, the *Sunglitter* of 1918, done for the Millesgården. It depicts a naiad with wind-blown hair riding a dolphin.

All the sculptures are new casts from models preserved at Millesgården, the residence and park given to the people of Sweden by Milles a few years before his death.

They were acquired for the Garden as the first major undertaking of the Gateway Foundation, organized last year to support cultural and educational projects. Its president is James D. Burke, director of The Saint Louis Art Museum, who was associated with Leigh Gerdine, president of Webster University, and Ethan Shepley, Jr., vice chairman of Boatmen's Bancshares, in establishing the Foundation. The substantial cost of the sculptures was borne by anonymous contributors.

Ownership of the Milles sculptures is vested in the Foundation, which arranged for their installation in the Missouri Botanical Garden on extended loan.

"The selection of the Garden by the Gateway Foundation as the long-term exhibitors of this collection is exciting not only for the Garden but for all of St. Louis," Raven said in announcing the project.

St. Louis figured significantly in Milles' American career. The sculptor's first exhibition in this country was at the then City Art Museum in 1931, and it was from this show that the museum purchased his monumental *Folke Filbyter* equestrian, now on loan to Laumeier Sculpture Park.

Other works by Milles in St. Louis include a small *Diana* at the Art Museum and pieces at Mary Institute and in private collections. These were on view at the Milles exhibition of 1985 at Laumeier Sculpture Park. His last work, *St. Martin of Tours*, the William Volker Memorial on the grounds of the Nelson-Atkins Museum, Kansas City, was completed from finished models after his death.

Detail, Orpheus Fountain Figure (Male, 1936) ▼

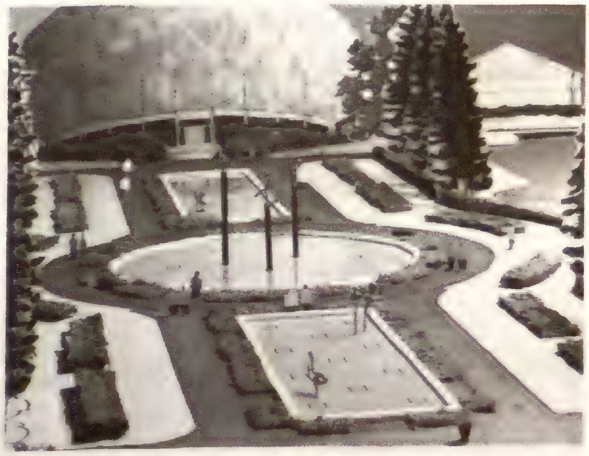
Two Girls Dancing (1917) ▶

Carl Milles was born in 1875 near Uppsala, Sweden, was apprenticed to a cabinet-maker in Stockholm, and won a sculpture scholarship in evening classes. He worked at odd jobs in Paris to support further study, and attracted the favorable attention of Auguste Rodin. He won prominence in Sweden, but was almost unknown in the United States until the St. Louis exhibition.

He accepted an invitation to become sculptor in residence at the then new Cranbrook Academy of Art near Detroit, and became an American citizen. His *Meeting of the Waters* generated a lively furor because of objections to the nudity of the figures representing the Mississippi and Missouri rivers. Milles died in Stockholm in 1955 at the age of eighty.

In their Garden setting the Milles figures from several of his projects over nearly a half century will be assembled into a new unity. From the days of the Brownie box camera to today's sophisticated image-recording equipment this has been probably the most photographed part of the Garden, the opening scene of a theater of arboreal wonders and delights in the heart of a crowded city. When it is reopened, it promises to become even more firmly established as one of the Garden's—and the city's—chief attractions. ■

An artist's model shows the proposed sites for the seven Milles sculptures in the pools in front of the Climatron. Installation is expected as early as spring 1988. ▶



Gardening at the Garden

The Oldest Trees at the Garden

Every so often the question arises as to which are the oldest trees at the Missouri Botanical Garden. Although early records are not accurate enough to pinpoint sources and planting times for most of the large trees, several trees are known or suspected on various bases to extend back to the time of Henry Shaw, the founder of the Garden. Only the fairly well documented trees will be covered in this article, so a few large trees remain out of the picture for the moment. It ought to be mentioned that many sizable specimens toward the south end of the Garden were planted around the turn of the century in the North American Tract, which once occupied a large portion of this end of the Garden.

Before Henry Shaw's time, the site of the Garden was virtually barren of trees.

One question that should be answered at the beginning is: are any of our trees older than the Garden? The answer is probably one, if you define "a tree" rather broadly. The site of the Garden was virtually barren of trees before Mr. Shaw's time. However, Tower Grove (the fenced shady area in front of Tower Grove House) is home to a stand of sassafras (*Sassafras albidum*) that could be hundreds of years old. Sassafras spreads by root suckers, so the clump may be one "individual" if underground connections were known. The clump lives on with new suckers growing up at times, although none of the individual trunks are terribly old.

A few words about sassafras: its most noticeable characteristics are its often mitten-shaped leaves and a spicy fragrance. (Sassafras belongs to the family Lauraceae, known for such fragrant members as cinnamon.) The aromatic properties are exploited in sassafras oil, which is used to flavor foods and in the famous spring tonic sassafras tea, a beverage suspected of containing cancer-causing compounds. 'Filet' from the inner bark is used (especially historically) in the South as a thickener in gumbo.

There is a record in Henry Shaw's papers of one specimen of *Salisburia adiantifolia macrophylla incisa* 15-18 inches tall purchased from Peter Lawson & Son in 1861. *Salisburia adiantifolia* is an obsolete name for the tree now called *Ginkgo biloba*, and the old record could refer to one of three large ginkgo trees believed to date back to Henry Shaw's time. One is at the south end of the new Jenkins Daylily Garden; one with low, spreading branches is east of the Lehmann Rose Garden; and one reigns just east of the walkway between the Ridgway Center and the Climatron.

Over 100 years old, these trees are young by ginkgo standards. In China, Japan and Korea cultivation of this species is older than written records, and some living individuals were probably planted in the last millenium. Oddly, roots reminiscent of those on a banyan descend like huge dangling fingers from the branches of very old ginkgo trees. Most ancient individuals grace Buddhist temples and shrines.

Although at first glance *Ginkgo biloba* may appear to resemble familiar broad-leaved trees, close inspection will show it to differ fundamentally from any other living species. The fan-shaped leaves are unique, and ginkgo trees do not form flowers or fruits. The globes on "female" trees are bare seeds.

Ginkgo is unusual because it represents the last remnant of a primitive plant group with an evolutionary history separate from all other trees. Ginkgoes and their extinct relatives flourished 280 million years ago worldwide, long before flowering plants evolved. Over vast periods of time the ginkgo group dwindled to the single species *Ginkgo biloba*, now found wild only in eastern China (or perhaps persisting from ancient cultivation even there).

Anyone who has encountered the foul fleshy outer layer of ginkgo seeds might be surprised to learn that the firm inner "kernel" is eaten like a roasted nut in eastern Asia. In fact, the name ginkgo comes from the Chinese, *yin-kou*, meaning "silver nut." Please do not try them, however, since handling the seeds causes painful allergic reactions in some people.

In the earliest days of the Garden (starting in 1860) the northwest corner, now mainly the maintenance complex, parking lot, and residential area across

Henry Shaw's arboretum, May 27, 1896, after the tornado.

Section of row of osage oranges that once connected Tower Grove House with Vandeventer Avenue.

Alfred Avenue, was Henry Shaw's arboretum, which saw its best days during the 1800s. In 1896 it was battered by the tornado that tore through St. Louis, and the remaining trees suffered further from later storms, sleet, and changing ideas about how to use the area. Four trees remain from the arboretum: a trio of bald cypresses and one European beech.

To take up the bald cypresses (*Taxodium distichum)* first, the old individuals tower about the maintenance buildings near the west fence at the Alfred Avenue gate not far south of the parking area. (A picture of them when younger appears in the December, 1932, *Bulletin*.) Bald cypress is indigenous to wet areas of the southeastern U.S. and reaches its natural northern limit at this longitude not far from St. Louis. It is an unusual conifer by being deciduous—entire branchlets drop off the tree.

Don't confuse bald cypress with its similar Chinese relative dawn redwood (*Metasequoia glyptostroboides*), which can be seen here and there around the Garden, especially between the Lehmann and Administration buildings. Bald cypress differs by having smaller needles attached to the twigs singly (the needles are attached pairwise in dawn redwood), and the spherical cones of bald cypress are larger than the somewhat elongated cones of dawn redwood.

The other diehard arboretum tree is a gnarled European beech (*Fagus sylvatica* var. *purpurea*) just north of the Mediterranean House. A glance at the trunk will convince you of its age. *Fagus sylvatica* is native to Europe and is popularly cultivated in this country, being represented by numerous cultivars, some of them with reddish or purplish and sometimes deeply cut foliage. It could be confused with the native American beech (*Fagus grandifolia*) but is easily distinguished by its flat-colored, fuzzy buds and twigs (these are glossy and more nearly hairless in the American species), and the European beech has leaves with much smaller teeth along the margins.

Long ago, a carriage road connecting Tower Grove House with Vandeventer Avenue to the northwest ran past the edge of the arboretum. Today it is not difficult to spot the path of the old road, since several of the osage orange trees (*Maclura pomifera*) that lined it still stand in a row behind the Climatron, and one that outlived the rest of its section of the row stands isolated between the Desert House and Tower Grove House.

Unrelated to oranges, osage orange is a member of the fig family (Moraceae), and like its relatives, figs and mulberries, the "fruit" develops from many flowers. In the present case, the aggregate fruit is the size and shape of a large orange (or softball), a tempting projectile to throw. (I have been the target of more than one of these.)

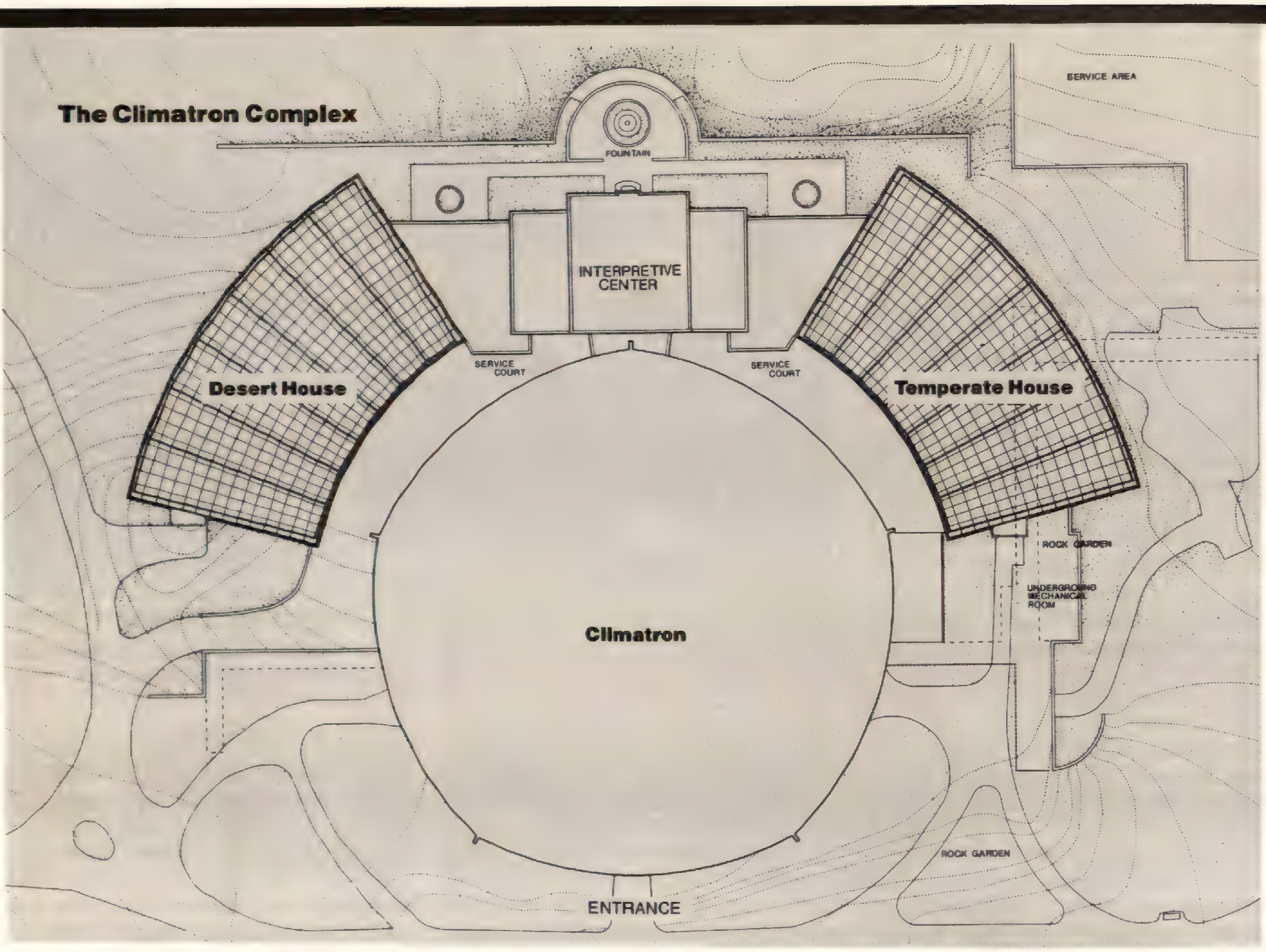
The hardness of the wood is exceptional, making it useful for special purposes, including bows (the type used for shooting arrows). As related by Garden botanist Dr. Julian Steyermark in his *Flora of Missouri*, this probably stands behind the name Ozark for the hills of Arkansas and southern Missouri. The French name for the tree is *Bois d'Arc*, meaning "bowwood," which became "Bodark" in local parlance, this leading to "Ozark" for its home region. (Although spread by human activity, the tree is most likely native to the south-central states and may not "belong" in Missouri.)

At the point where the old osage orange road arrived at Tower Grove House resides an enormous wych elm or Scotch elm (*Ulmus glabra*) thought by former Garden geneticist Edgar Anderson to have been planted possibly during Henry Shaw's residence in the house. (Dr. Anderson wrote a short article on this tree for the *Bulletin* in 1958.) Records show that a wych elm, probably the specimen in question, was seriously damaged during a snow storm and then by a "cyclone" in 1927. The name "wych" is an Anglo-Saxon word indicating a tree with flexible branches—it surfaces again in the common name "witch hazel" for members of the unrelated genus *Hamamelis*. The "wych" elm became "witch elm" and worked its way through this channel into folklore connected with witches. The tree is indigenous to much of Europe and is common and noble in Scotland and Ireland. It is easily recognized by having coarse leaves broadened above the middle.

The final tree believed to have been known to Mr. Shaw is a Missouri native. The yellowwood (*Cladrastis kentuckea*, widely known as *C. lutea*) ranges across much of the southeastern United States, just reaching southern Missouri. Its membership in the legume family (Leguminosae) is revealed by its showy, white, pealike flowers and fruits that look a little like flat beans. The name yellowwood is a carryover from the days when a yellow dye was obtained from the wood. Propped up on crutches, the old individual at the Garden is by the east wall south of the Flora Gate. A photograph of it when younger appeared in the *Bulletin* for February, 1923.

It takes a little imagination to envision the Garden when these trees were young. It requires more vision to imagine how the saplings of 1987 will look when a few of them become the oldest trees of the Garden.

—George Rogers, Garden Taxonomist



THE CLIMATRON RENOVATION

By Geoffrey L. Rausch

Principal Environmental Planning and Design Landscape Architects for the Garden

Occasionally as I fly to St. Louis from my office in Pittsburgh the pilot will make the approach to the airport directly over the Garden. While I am accustomed to seeing it in plan view from our studies, it is exciting to look down and see the many new developments that occur each year. From the air, the Garden is easy to identify because of its faceted geodesic dome. In many respects it does resemble a gem rising out of a ring of colorful gardens that surround it on all sides. Soon it will take on a new luster and its sparkle will be seen from afar.

From earlier articles you are aware that the Climatron, now in its 27th year, has begun to tarnish. Its once gleaming surface has cracked and deteriorated to the point where only about 50 percent of the available light can penetrate to the plants below. And as so many have experienced, it often rains on the inside because of leaking joints and condensation. When it was built, it was state-of-the-art construction. It used the latest materials including a Plexiglas skin, which has served well for many years.

Now it is time to upgrade the building using the most current technology once again. Architect Jim Morgan has done just that. Beginning in May of 1988 a contractor will begin to remove all 3,625 panes of Plexiglas and replace them with a product called "Low E" glass. This is tempered laminated glass that will help reduce heating bills by retaining the solar energy captured during the day for heating during the night. Like automobile windows, the glass will not fracture into sharp, deadly pieces if accidentally broken, but will break into large granules that will not cut. Incidentally, a major component of the glass is manufactured by Monsanto here in St. Louis. In addition to the glass, there will be a new supporting system for the glazing, and unlike the old system, it will be rigid and will have integral gutters to carry off any condensation. As the Climatron is a world-renowned landmark, great care has been taken to insure that it will look the same except for its new polish.

While I have always been fascinated by the intricate design of the exterior, it is the lush beauty of the inside that has been

ADDING NEW SPARKLE TO THE GEM OF THE GARDEN

most appealing to me. Several years ago Peter Raven asked us to think about what might be done to further enhance this display. I must say that while I was excited about the prospect of working on the design, I wondered about what could be done to improve its present beauty. Early on we began to work with the staff at the Garden to see what problems needed to be addressed.

Surprisingly, there were quite a few. The horticulture and the maintenance staff were quick to tell us that the heating and ventilation systems did not work well, and in some cases were worn out after years of service. Dr. Raven suggested that though the tropical setting was attractive, it did not tell visitors the story about the destruction of the tropical rain forest and how it will impact on each of our lives if it is not abated.

The education department said it was hard to get people up the steps at the front and impossible to get handicapped visitors to the lower level of the Climatron. Also, there were not enough spaces for groups of visitors to gather to hear the guide. Children and adults have always enjoyed the novelty of walking through the tube under water, but despite many attempts to fix its shortcomings it has never worked properly and takes much labor to keep it up.

As we pondered these and many other problems with the director and staff, one thing kept coming through loud and clear—that the finished design must be beautiful while it accomplished the other objectives. This demand lead to our design philosophy that stated simply that our goal would be to provide a functional and lovely tropical setting that contains many elements from the tropical rain forest and to display them in a way that will interpret the fragile nature of this threatened ecosystem to our visitors.

We were indeed fortunate to have many fine plants to use. Some 60 trees will be retained and protected during construction. You might be interested, as I was, to know that some of the cycads in the collection are over 200 years old and came from a display at the St. Louis World's Fair in 1904. Obviously great care will be taken of them.

In general terms the new concept for the Climatron will divide it into three major parts. The upper area will primarily be plants of the forest floor, while the lower floor, with its greater headroom, will focus on the tree canopy. In between, a new mountain, representing the Central American Ridge, will rise between the upper and lower level. Here will be found plants indigenous to this habitat.

When the dust clears in about 18 months and visitors begin arriving, they will see a familiar face on the outside, but will notice many new things as they tour through the structure. The front steps, a roadblock to many, will be gone, replaced by an on-grade access between flanking retaining walls. Automatic doors will provide easy access and conserve energy.

Inside, a small room with striking graphics will challenge each visitor to enjoy what he or she is about to see because it is rapidly disappearing. To evoke a feeling of the tropics you will pass through a small native hut and see out its window a sparkling waterfall tumbling from the Central American Ridge mountain and surrounded by lush jungle plants. Along the way the path climbs and loops past many collections such as, the nepenthes, gesneriads, cycads, bamboos, rattans, bog plants, marsh plants, and epiphytes. There will be an exhibit of buttressed trees, another of medicinal plants and a major display of economic plants.

Some of you may remember a *National Geographic* article about a Missouri Botanical Garden scientist doing work in the rain forest of Central America. A replica of the research platform he was using in his work will be placed in the tree canopy except, of course, it cannot be as high as it was originally. This last exhibit is significant because it gives the visitor a lasting impression that tropical research is an important part of the Garden. A later article will describe more fully all of the interpretive and educational displays, but be assured it will, in a very interesting and complete way, tell about all facets of the tropical rain forest.

So far the tour has been educational and beautiful. It will also be fun! Walking under a waterfall, on a catwalk through the tree canopy and down a ramp cut into the mountainside will provide a variety of enjoyable experiences for all.

There is another surprise. Having walked through the upper floor, down the mountain range to the lower level and finally past the research platform, you will leave by a new exit out the rear of the Climatron to a new building that will be used to house exhibits. More about that later.

One familiar face will be missing. The once impressive mechanical control panel

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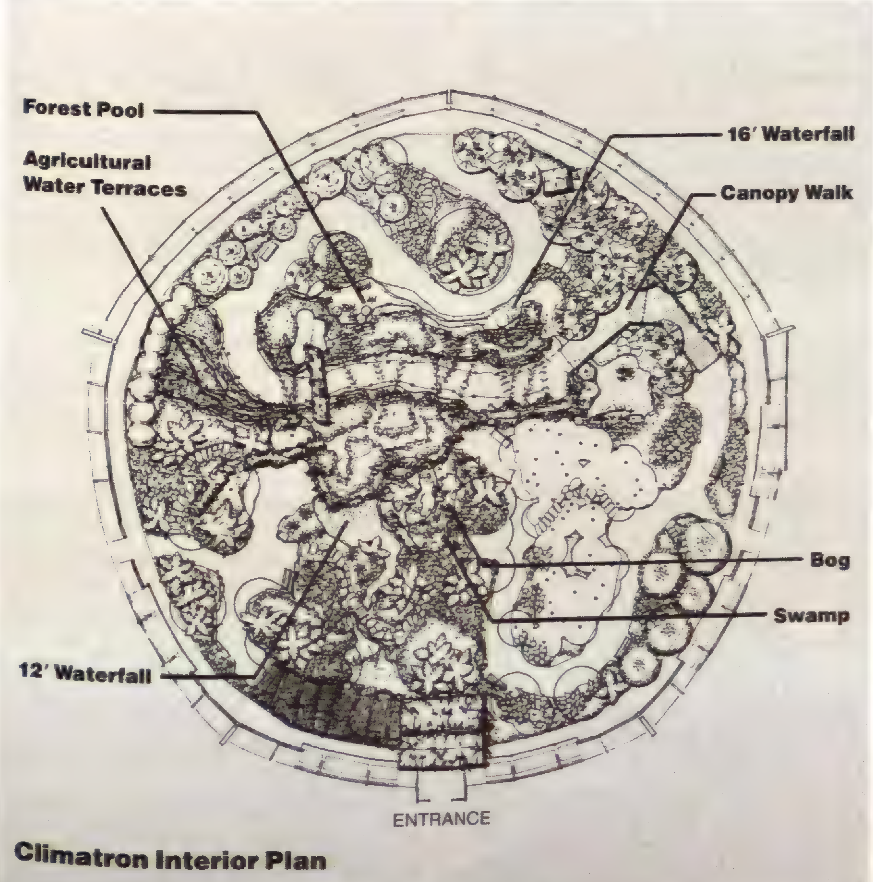


Climatron Interior Plan

CLIMATRON *continued*

at the front door will be removed. From a concealed location in the basement of the structure, modern controls will operate a new and efficient heating and ventilation system. Ross and Baruzzini, a local consulting firm, has designed a completely new system that will benefit plants and visitors alike. For example, we learned from Alan Godlewski, Chairman of Horticulture, that plants need good air movement for vigorous growth. A large fan called a "cannon fan" will blast air from a opening in the top of the mountain towards the ceiling eliminating the air stratification that presently exists. Noise from the fans will be masked by the sound of water coming from the three waterfalls cascading from the mountain.

Modern technology will play its part on the inside too. The mountain and other rockwork will be made from fiberglass reinforced concrete. It will look like real basaltic rock and will support hundreds of plants growing from hidden plant pockets and crevices. The walks will be constructed of exposed aggregate concrete and will have a nonslip surface. Finally, benches will be provided at key places for relaxation and enjoyment.

So far on our trip through the Climatron we've seen some beautiful tropical plants combined into lovely scenes. We've had some fun along the way, and we've learned that all of this beauty is threatened. However, in the lush envelope of the Climatron it's hard for us to really feel the impact of the destruction of the rain forest. Our interpretive consultants, Krent/Paffert, realized this and proposed a separate structure to address this most important concern. This new small structure will be located to the rear of the Climatron. Its exhibits will be hard hitting and informative. We hope each visitor will depart with the knowledge and the desire to implement a strategy to abate the devastation of the rain forest.

This new building will also house exhibits that relate to the proposed new Temperate House and in the future to a new Desert House. In many respects it is like a hub with connecting spokes that reach out and link it to the Climatron, Temperate House and later to the Desert House. The innovative concept has been given its design form by the Christner Partnership, Inc., who were also selected to design the new Temperate House to replace the old Mediterranean House.

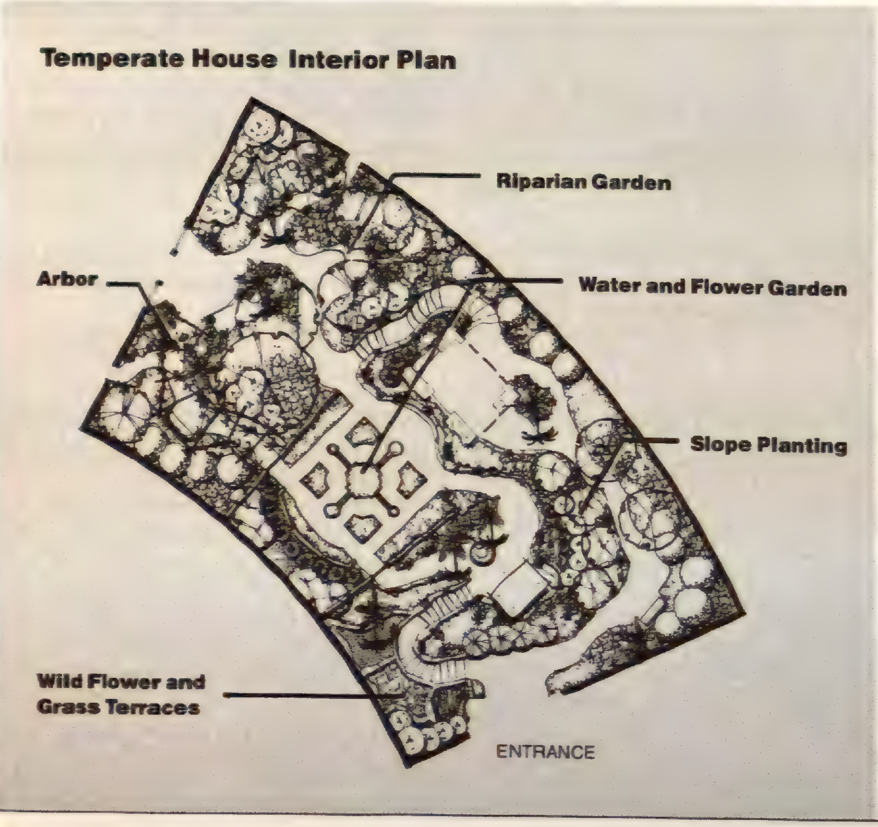
Like the Climatron, the "Med House," as it is commonly called, has suffered from old age. A structural analysis indicated that it would be more economical to replace it than to repair it. And to be sure, a better display space could be provided. Because the Med House is in worse shape than the Desert House, it was decided to rebuild it first. But because both of these greenhouses flank the Climatron, a common design style was sought. The architects, sensitive to the "Landmark" status of the adjacent Climatron, have created a crystalline shape that reinforces the curve of the Climatron but recedes from view as it encompasses the sides and rear.

The Climatron emphasizes its structure by exposing it on the outside; in deference, the new Temperate House conceals its structure within. It, too, will use the energy efficient "Low E" glazing and its roof plane will maximize the solar access to the interior. The north side is the highest with a clear height of nearly 40 feet. The main entrance to the Temperate House will be from the lower level at the same grade as the lower floor of the Climatron. A secondary entrance will be at the upper level somewhat west of the existing door to the present Med House.

As the name implies, the Temperate House will have a broader scope than the existing collection. Obviously, it houses "temperate" plants, but only those that will not survive our freezing weather. Because many of the plants that meet these conditions come from the Mediterranean region, the interior will have that flavor as its design motif. Generally speaking there will be, as in the Climatron, several broad categories of collections—the wet or riparian area and the drier areas. Within these areas we will have a phytogeographic collection (similar plants from diverse locations), a biblical area, economic plants, a Persian walled garden with many flowers, and a wildflower hillside.

Again, rock formations will be created from fiberglass reinforced concrete, and visitors will be encouraged to climb up steps cut out of the rock cliff to get to the upper level. Here they will find an arbor with a Mediterranean feeling. From this vantage they can look down to the squares of color in the Persian Garden below. As in the Climatron there will be an emphasis on beautiful plantings, but there is a serious side as well. Interpretive displays in both the "hub" building and throughout the Temperate House will attest to the serious threats to the temperate regions of the world.

If funds are available, construction on the Climatron and Temperate House will proceed concurrently and should be completed by late fall 1989. ■



Temperate House Interior Plan

Ask the Answer Service

Moving Plants Indoors

Do you have a plant question? Call the Horticultural Answer Service, Monday through Saturday, 9 a.m. to noon, at ***577-5143.***

Q. I've had my houseplants outdoors all summer. When is the best time to bring them indoors?

A. Try to have your plants back inside the house by the middle of September. Plants should have about a month to gradually acclimate themselves to the indoors before the heat is turned on.

Before moving the plants, prune back any ungainly branches, and hose off the foliage and the pots. Check under the pots for slugs and pill bugs. Spraying now with an approved insecticide will help minimize pest problems during the winter.

Q. I received a lovely Christmas Cactus last year that bloomed beautifully. What can I do to make it bloom again?

A. Assuming it has had good care this summer (*i.e.* plenty of water and occasional feedings), keep it on the drier side now, but not so dry it wilts. Christmas Cacti (*Schlumbergera bridgesii*) set buds in response to shorter days and cooler temperatures. To take advantage of this tendency, leave the plant outdoors in a protected site until the first week of October. The long, cool nights will stimulate bud formation and flowering should occur around Christmas.

Q. I have some bare patches in my lawn after this hot summer. When is the best time to reseed my lawn?

A. Grass seed for cool season lawn grasses such as Bluegrass and Fescues should be sown in early September. Any time from August 25 to September 15 is ideal. Prior to seeding, bare spots should be prepared well by spading, removing any weeds, incorporating lime (if needed) and organic matter. Rake smooth before seeding, and sprinkle the seedbed daily until grass germinates.

Q. Can I leave my Canna and Gladiolus bulbs in the ground overwinter?

A. Neither of these bulbs are reliably hardy in St. Louis and should be dug once frost has nipped their foliage.

Q. I'd like to make my Poinsettia "flower." It has been growing outdoors all summer. What do I do?

A. Poinsettias are most difficult to bloom again, but if you care to try, here's how. Starting in mid-September, place the plant in complete darkness for at least 14 hours daily. Five o'clock to 7:00 a.m. is a convenient schedule. The other ten hours the plant must be exposed to full sun. Keep the soil moist and feed regularly. Night temperatures should not be above 60°F. Continue this regimen until the foliage develops color. They make take six to ten weeks.

Q. What is the fall frost date for St. Louis?

A. October 20 is the date of the average first frost for the St. Louis area.

Q. How do I know when winter squash is ready to be picked for storage?

A. When the colors have darkened and the skin can no longer be dented by your thumbnail. Harvest before frost kills the vines. Be sure to leave an inch or two of stem on each squash or they won't keep long.

Q. I'm planning on renovating my lawn. It's in terrible shape. When is the best time?

A. The best time to reseed a new lawn is about Labor Day. You can begin to get the soil in good condition now, though, by rototilling to a depth of six to eight inches and sowing a cover crop of buckwheat in early July. Turn this "green manure" crop under in five or six weeks to provide a low cost supply of organic matter that will benefit your lawn for years to come.

Q. Can Parsley be dug and grown indoors? It seems like a waste to let these plants die.

A. Yes. Parsley grows well inside in a cooly sunny site. Dig the plants before a heavy frost and place in a tall pot to accommodate Parsley's long tap root. Use a well-drained soil mix and cut the plant back. New growth will sprout soon.

Chives may also be dug and grown inside in the winter. In order to succeed indoors, through, chives should have their foliage nipped by frost first before bringing inside. Grow in a cool, sunny window, also.

Q. When is the best time to plant spring-flowering bulbs?

A. Spring bulbs should be planted outside as soon as they become available in September and October. Tulips are the exception to this rule. They should be kept cool and planted in late October.

Q. What can I do in fall to improve the soil in my vegetable garden?

A. Make sure you turn under or rototill all summer mulches. Till in as many bags of fallen leaves as you can. These will mellow nicely overwinter. If you have any leftover compost, till it in also. Sow a cover crop this fall. Cover crops hold the soil in place overwinter and their roots and tops add abundant organic matter when incorporated into the soil. Annual ryegrass may be sown in early fall and will be killed by heavy frost after making rapid growth. Perennial ryegrass and field rye will survive the winter and renew growth in the spring. Choose a cover crop that best suits your purposes.

—Chip Tynan, The Answer Service

Don't miss Chip on the KXOK Garden Show (AM 630) each Saturday from 8-9 a.m.

SEPTEMBER-OCTOBER

DAY-BY-DAY

SEPTEMBER

1987
JAPANESE
FESTIVAL

AUGUST 29–LABOR DAY

9 a.m. to 10 p.m. daily except 9 a.m. to 8 p.m. Sept. 1, 2 & 7. Ridgway Center and grounds. Annual salute to the culture of Japan, with this year's theme of "Living Treasures of Japan," featuring performing arts, food, music, arts & crafts and more.

8 **Garden Hours Change**
9 a.m. to 5 p.m. daily through May 27, 1988. Greenhouses and Tower Grove House close at 4:30 p.m.

19 **Members Dawn Photo Session at Shaw Arboretum**
5:30 a.m., Sat., Shaw Arboretum. A rare opportunity for the photographer to capture the beauty of the Arboretum at dawn! Coffee will be available. Rain or shine. It's a Members' Day at the Garden too.

19–20 **Greater St. Louis Men's Garden Clubs Show**
Noon to 5 p.m. Sat., 9 a.m. to 5 p.m. Sun., Ridgway Center. See the best flowers, fruits and vegetables of the Men's Garden Clubs.

21 **Plant Clinic**
9 a.m. to noon, Mon., Ridgway Center. Free diagnosis of insect, disease or nutrition problems with plants. Plant identification also.

22–24 **Fall Bulb Sale**
9 a.m. to 5 p.m., Tues.–Thurs., Ridgway Center. A prime opportunity to get a great buy on the many bulbs in stock. Members receive a 20% discount.

23 **Autumnal Equinox**
The first day of Fall is just the excuse you need to visit the Garden.

26–27 **Dahlia Society Show**
Noon to 5 p.m. Sat. and 9 a.m. to 5 p.m. Sun., Ridgway Center. See dozens of the very best dahlias in the St. Louis area.

OCTOBER

3-4 **St. Louis in Bloom**
9 a.m. to 5 p.m., Sat. & Sun., Ridgway Center. A competitive floral and horticultural exhibit by members of The Garden Club of America clubs. Also educational videos on endangered plants, the Nature Conservancy and Gateway to Gardening Association. Sponsored by the Ladue Garden Club and The Garden Club of St. Louis.

4 **Fall Walking Tour**
2 p.m., Sun. Meet at Ridgway Center. Autumn can be St. Louis' loveliest season! Come enjoy it with the Garden Guides on their regular first Sunday of each month tour. Free. Call 577-5140 for reservations.

7 **Members' Cider Stroll**
5 p.m. to 6:30 p.m., Wed. The Garden in fall is a delightful place to sip cider and stroll. Enjoy the Garden after the 5 p.m. closing. Just what Members like! It's also a Members' Day—all day.

9–25 **Stick People Exhibit**
9 a.m. to 5 p.m. daily. Garden Grounds. Unique outdoor sculpture exhibit consisting of twigs and branches by St. Louis artist Sue Berkey. *St. Louis Arts Festival.*

"Where Dragons Touch the Earth"
9 a.m. to 5 p.m. daily, Ridgway Center. Photographic exhibition of Chinese gardens by David H. Engel, a prominent American landscape architect. *St. Louis Arts Festival.*

18 **Children's Art Festival**
11 a.m. to 4 p.m. Sun. Garden grounds. A variety of hands-on activities and performances designed to enhance the artistic and cultural awareness of children. Presented by the Arts and Education Council of Greater St. Louis. Admission $1.

24–25 **Lily Bulb Sale**
9 a.m. to 5 p.m., Sat. & Sun., Ridgway Center. A great selection of lily bulbs on sale by the Mid America Lily Society.

25 **Henry Shaw's Halloween Garden**
3 p.m. to 8 p.m., Sun., Ridgway Center. A favorite Members' event—a command repeat performance of goblins, ghosts and lots of fun for the whole family. This Halloween adventure features magic, the storytelling of Hepatica and her winsome woodland witches, face painters, a costume contest and "characters" of all types. Mark your calendars now for the Halloween party of the season. Watch your mail for details.

31 **Apple Pickin'**
11 a.m. to 3 p.m., Sat., Ridgway Center. The apple will be the theme of lectures, food demonstrations, and films. Free.

Members' Preview
There will not be a Members Only preview party of fall flowers in October due to construction taking place in the Garden. Please join us in November for a very special preview party to welcome in the holiday season.

SEPTEMBER-OCTOBER

COURSES & LECTURES

AT THE GARDEN

NOTE: Class descriptions and registration information for fall courses can be found in the *1987 Fall Courses and Lectures* brochure which was mailed to all Members recently. For more information call the Education Department at 577-5140.

SEPTEMBER

8 (Tu) Hostas
Pruning Indoor Plants
9 (W) The Garden In Pen, Ink and Washes *(6 sessions)*
Basics of Contemporary Floral Design *(3 sessions)*
10 (Th) Perennial Garden Design *(3 sessions)*
Advanced Lawn Care *(3 sessions)*
12 (Sa) Wild Flower Collecting Trip
13 (Su) Basket Making
14 (M) Gardening Techniques *(6 sessions)*
Lawn Care *(4 sessions)*
15 (Tu) Winterizing Your Roses
New Perennials
Growing Irises
Garden Design Walk
17 (Th) Origins of Japanese Gardens
19 (Sa) Gift of Flight
22 (Tu) Thai Cuisine *(2 sessions)*
23 (W) Raising Missouri Wildflowers
26 (Sa) Breakfast with the Birds
Family Tree

OCTOBER

3 (Sa) Basic Horticultural Methods —Clarkson *(4 sessions)*
4 (Su) Fall Migration on the Mississippi Flyway
5 (M) Japanese Garden Walk
6 (Tu) Trees for St. Louis
Japanese Garden Walk
7 (W) Home Landscape Design *(5 sessions)*
Plants of the Tropics —Clarkson *(4 sessions)*
8 (Th) Herbs: Indoor Culture and Uses *(3 sessions)*
Small Ornamental Trees
11 (Su) Chinese Brush Painting *(6 sessions)*
12 (M) Nature Photography
13 (Tu) Dwarf Evergreens
14 (W) Native Missouri Tree Walk
Intermediate Floral Design *(3 sessions)*
15 (Th) Ornamental Grasses
17 (Sa) Planting for Success
Compost Workshop
Autumn Woody Plants Walk
19 (M) Critical Issues Forum *(5 sessions)*
20 (Tu) Indian Cuisine *(2 sessions)*
Aquatic Gardening
21 (W) Garden Collage *(5 sessions)*
Herb Garden Walk
Hardy Lilies
22 (Th) Peonies and Daylilies
24 (Sa) Bulb Planting and Care
Natural Art
28 (W) Ornamental Shrubs
29 (Th) Azaleas and Rhododendrons

AT THE ARBORETUM

SEPTEMBER

5 (Sa) Evening Prairie Walk
8 (Tu) Fall Wildflower Walk
11 (F) Nocturnal Awareness Hike
12 (Sa) Evening Prairie Walk
15 (Tu) Fall Wildflower Walk
18 (F) Nocturnal Awareness Hike
19 (Sa) Evening Prairie Walk
22 (Tu) Fall Wildflower Walk
26 (Sa) Basket Making
Trees of the Arboretum
29 (Tu) Fall Wildflower Walk

OCTOBER

2 (F) Nocturnal Awareness Hike
3 (Sa) Cord Making
6 (Tu) Fall Wildflower Walk
9 (F) Nocturnal Awareness Hike
10 (Sa) Fall Family Ramble
13 (Tu) Fall Wildflower Walk
17 (Sa) Meramec Float Trip
24 (Sa) Ethnobotany
31 (Sa) Night of Enchantment

HARRIET RODES BAKEWELL RECEIVES GREENSFELDER AWARD

St. Louis landscape architect Harriet Rodes Bakewell received the Missouri Botanical Garden's Greensfelder Award in a ceremony in the Ridgway Center on Sunday, June 21. The presentation was attended by Garden trustees, Members and staff, and family and friends of Mrs. Bakewell.

The Greensfelder Award was established in 1980 in memory of Albert P. and Blanche Y. Greensfelder to honor individuals who have made substantial contributions to promote a better environment through conservation and urban improvements.

Mrs. Bakewell attended the Washington University School of Architecture (1929-1934 & 1946-1947) and Harvard University's Graduate School of Design (1929-1930). She was named a Fellow by the American Society of Landscape Architects in 1983. Her architectural expertise has been utilized in several Garden attractions, including the Japanese Garden, the Anne L. Lehmann Rose Garden, the Shapleigh Fountain, and the Waldemer Memorial Fountain.

Her architectural and design skills were also employed at Lambert-St. Louis International Airport, McDonnell Douglas Engineering Campus and Space Center, Maritz Inc. headquarters, West Port Plaza, Steinberg Memorial Skating Rink in Forest Park and numerous private residences.

She is the daughter of Dr. George T. Moore, Missouri Botanical Garden director from 1912 to 1953 and director emeritus from 1953 to 1956. The family lived in Tower Grove House (Garden founder Henry Shaw's country home) until the current director's residence was built in the southeast corner of Garden grounds in 1914.

News From The Library

Library Acquires Important Flora at Sotheby's Auction

In late April, 388 color-plate books, including many of the "monuments" of botanical publication, were sold at Sotheby's in their book auction rooms on Bloomfield Place, down a narrow passageway opposite their main art auction rooms on Bond Street, in London. The books represented the most spectacular titles in the collection of Robert de Belder, who assembled his library in conjunction with the development of his Arboretum Kalmthout, near Antwerp, Belgium. The importance and size of the collection resulted in great interest in the auction, attracting an overflow crowd, including Dr. Dale Johnson, the Garden's Reference Librarian/Bibliographer.

Fortunately, the Garden's library already holds many of the botanically important titles offered at the sale, but auctions, especially an important one such as this, provide an opportunity to acquire titles that rarely, if ever, become available through, for example, antiquarian booksellers. De Belder had acquired many of his books at previous auctions.

Through the generosity of C. C. Johnson and Edith Spink, the library was able to bid successfully and obtain *Flora Tasmaniae* (1855-1859). This two-volume work, with *Flora Antarctica* (which the library also owns) and *Flora Novae-Zelandiae*, constitute *The Botany of the Antarctic Voyage of H.M. Discovery Ships Erebus and Terror, in the Years 1839-1843.* It was on the voyage of the *Erebus* and *Terror* that Joseph Dalton Hooker, who was to become Charles Darwin's friend and botanical consultant, served his scientific explorer's apprenticeship, much in the manner of Darwin on the *Beagle*.

Acquiring this original edition of *Flora Tasmaniae*, with its hand-colored plates depicting mosses, angiosperms, and other plants described from collections made during landfalls on the voyage, helps make the library's collection of the works of W. J. and J. D. Hooker, the father and son who were the first two directors of the Royal Botanic Gardens, Kew, nearly complete. The work is of importance in the study of the floristics of the southern hemisphere. Tasmania, Antarctica, and New Zealand, in addition to Australia, Africa and Madagascar, India, and South America, once connected in the supercontinent Gondwanaland, show botanical affinities arising, at least in part, through this former proximity. The old Gondwanaland includes lands of current interest in the Garden's research program. The *Flora Tasmaniae* is also prefaced with Hooker's "Introductory Essay," an early explication of some of the principles of biogeography as interpreted in the light of the theory of natural selection, developed, of course, by his friend, Darwin.

Adopt-A-Book Program Sponsors Conservation

The Missouri Botanical Garden Library has an international reputation for a strong collection of botanical books dating from 1474 to the present. The library's Shoenberg Conservation Center is responsible for restoring, rebinding, and repairing books in the collection. Susan Finley, supervisor of the Shoenberg Conservation Center, has chosen several books to be conserved at the Garden or sent to an outside conservator. These books need to be conserved to make them usable and to ensure that they remain available for future generations.

The cost to sponsor a book includes estimated administrative and rebinding costs as well as a contribution to the Special Books Fund, a fund used to purchase and restore rare books. Donations can be made directly by an individual or in honor of another person. A bookplate indicating the sponsor will be placed in each book, and a card will be placed in a special file, called the Association File, listing each title conserved under the sponsor's name.

If you have a special interest in books and want to contribute to the library's efforts to conserve them, call Connie Wolf at 577-5156 with your choice from the list below. You are invited to select the book you want to sponsor and to see the Shoenberg Conservation Center.

- *Anales de la Flore et de Pomone, Paris, 1832-.* Our nine volumes of this early horticultural journal needs rebinding ($1800).

- *Botanist, London, 1836-.* Our four volumes of this horticultural journal, coauthored by J. S. Hensley, Darwin's botanical teacher, needs rebinding ($800).

- *Codex Vindobonensis Medicus Graecus, by Dioscorides.* Our copy is the 1965-1970 faithful facsimile of the ca. 512 manuscript preserved in the Austrian National Library, which is the earliest and most important illustrated herbal of classical Greece. Dioscorides' teachings retained an important place in medicine, even into the nineteenth century. Our copy needs to be bound into its pigskin-covered boards ($800).

- *Flora Atlantica, 2 volumes, quarto, Paris, 1798-1799, by René Louiche Desfontaines.* Illustrater, with some plates after Redouté, Desfontaines' Mediterranean collections. Rebinding ($1000).

- *Flora Virginica, second edition, quarto, Leiden, 1762, by Johan Frederik Gronovius.* Important work by correspondent of Linnaeus. Rebinding ($400).

- *Flore Pittoresque et Medicale des Antilles, 8 volumes, octavo, Paris, 1821-1829, by Michel Etienne Descourtilz.* Illustrates economically important plants of the West Indies. Rebinding ($2500).

- *The North American Silva, 1853, 3 volumes, by Thomas Nuttall.* This important and beautifully illustrated work contains some of the first descriptions of forest trees of America. Rebinding ($1000).

- *Observations on the Genus* Mesembryanthemum, *octavo, London, 1794-1795, by Adrian Hardy Haworth.* Contains descriptions of many new species of succulent plants. Rebinding ($300).

- *Paxton's Magazine of Botany and Register of Flowering Plants, 1834-1849, 16 volumes.* This periodical has beautiful color illustrations of new and uncommon plants and contains the first descriptions of many species. Rebinding ($3000).

Research News

Delegation from Madagascar Visits Garden

A high-level, six-member delegation from Madagascar, headed by the Minister of Water and Forests, Mr. Joseph Randrianasolo, recently visited the Garden to discuss the botanical research and conservation projects currently being conducted there, and to examine ways in which the Garden's involvement in Madagascar can be expanded and strengthened even more in the future. The delegation met with the Garden's Director, Peter H. Raven, and with Porter P. Lowry II, who heads our Madagascar Research Program. Madagascar, an island about twice the size of Arizona located off the southeastern coast of Africa, is home to perhaps 10,000 species of flowering plants, more than four-fifths of which grow nowhere else in the world. It is also home to many unique forms of animals, including lemurs, a group faced with problems of rapid deforestation and loss of native habitats, making it one of the world's highest conservation priorities. The government of Madagascar is, however, engaged in an extensive program to save their tremendously rich flora and fauna, and the Garden is offering its assistance and technical expertise in this critical effort.

African Research Project Receives Grant from World Wildlife Fund

Dr. Duncan Thomas, assistant curator of African botany, has received a grant of $4,950 from the World Wildlife Fund (WWF) for a project called "Ethnobotany of the Korup National Park." The grant is effective through December 1988.

Ethnobotany is the study of the relation between primitive human societies and the plants of their environment. The WWF grant will give Thomas the opportunity to study the people who use the park, a 300,000-acre tropical rain forest in southwestern Cameroon, a country on the coast of central west Africa.

The project will study two different tribal groups, the non-Bantu Korup people on the western side of the park, and several closely related Bantu tribes on the eastern side. Thomas will document the ways in which both groups use the native vegetation, particularly for food and medicine.

Grant for Ecuador Study

The U.S. Agency for International Development (AID) Mission to Ecuador has awarded a three-year grant of $106,000 to the Garden for a botanical study of the trees species in the Amazon region of Ecuador. This study will provide information for proper forest protection and management techniques by Ecuador's National Forest Directorate.

LIBRARY NEWS continued

Books on Microfiche

The Missouri Botanical Garden Library was selected from among several botanical libraries to be awarded a set of *Plant Taxonomic Literature Microfiche Collection*, a collection of 5,000 books on microfiche that are among the most significant botanical titles ever published. This collection is being received from the publisher, The Meckler Corporation, in return for cataloging each title into OCLC, an automated bibliographic data base that reaches more than 6,000 libraries worldwide. While the library already owns actual copies of a large portion of the titles in this collection, the microfiche will fill in for titles or editions not owned and will allow ease of photocopying so that the books, many of which are quite old and fragile, can be preserved.

Garden Receives Sculpture as Gift

A sculpture by Italian artist Emilio Greco titled "Grande Baigneuse, No. 3," also known as "Bather," has been given to the Garden by Patricia Aloe Tucker of St. Louis. The sculpture can be seen in the pool on the west end of the Swift Family Garden, adjacent to the Linnean House.

The sculpture is of cast bronze and depicts a full-length, elongated figure of a woman with her hands on her hips. It was created in 1959.

"Mrs. Tucker's generosity gives all Garden visitors the opportunity to enjoy an outstanding piece of art," said Alan Godlewski, chairman of horticulture. "Its beauty is enhanced by its location: the Swift Family Garden has never looked better."

Greco is a self-taught artist who specializes in the female figure, especially that of dancers and bathers. His work is represented in collections and exhibits throughout the world.

Mount Pleasant Winery

GARDEN TO OFFER SELECT MISSOURI WINES

The Missouri Botanical Garden has selected Mount Pleasant Winery in Augusta, Missouri, to produce a special bottling of wine and champagne. The award-winning vintages were officially introduced on July 24, 1987, at the Members' picnic supper in honor of Henry Shaw.

Peter H. Raven, Garden director, said, "We certainly thought the commemoration of Henry Shaw's birthday was the appropriate time to introduce these wonderful wines. From what we know of Shaw, he seemed to have a real appreciation for fine wines. In addition to the legacy of the Missouri Botanical Garden, Mr. Shaw included some of his personal wines as bequests to friends through his will." Shaw died in 1889.

The wine selected by the Gardenview Restaurant includes Emigré Blanc '86, a dry white table wine that was named "Best of Show" in the 1987 Missouri Wine Competition.

Appropriate labels have been designed for both offerings. The champagne label will feature an historic illustration of Tower Grove House. A botanical illustration taken from the Garden's archives and rare book collection will grace the label of the white table wine. Both wines will be available through the Gardenview Restaurant. The white wine is priced at $8 a bottle. The champagne will sell for $10 a bottle.

Green Tree Gourmet, a catering subsidiary of Gardenview Restaurant, will offer the wines for private parties at the Garden. For more information on purchasing these selected wines, call Gardenview Restaurant at 577-5196 or Green Tree Gourmet at 577-5119.

The CAMPAIGN for the Garden

Campaign for the Garden Update

As of July 31, the Garden's capital fund drive had raised $8,516,165, and is now over halfway toward its $16 million goal. A generous $750,000 team pledge from the McDonnell Douglas Foundation and the McDonnell Douglas Employee Charity & Community Services Plan of St. Louis helped reach this milestone.

Reaching the halfway point in just nine months reflects, in large part, the community-mindedness and generosity of the trustees and particularly, the support pledged over the next few years by St. Louis' Civic Progress corporate leaders. These early contributions have been critical to attracting other gifts and have given the Garden immediate income with which to begin the first phase of capital construction, the replacement of our antiquated production greenhouses.

McDonnell Douglas joins four other Civic Progress companies who have made gifts at a high level: the Emerson Electric Company, the Southwestern Bell Foundation, the Anheuser-Busch Charitable Trust and the Monsanto Fund (which designated its gift to the Main Gallery in the Center for Home Gardening Pavilion, an exciting, entirely new facility scheduled for construction, beginning in 1989). The Civic Progress portion of the fund raising total accounted for $5,781,600 at the end of July.

Other items of interest: A model of the new Center for Home Gardening project is on display in Monsanto Hall and visitor interest has been remarkable. This model will soon be joined by a model of the Climatron complex envisioned for construction over the next several years. Three features contained in the model, the completely renovated Climatron, a new, expanded Temperate House (replacing the Mediterranean House), and an Interpretive Building linking the two (for exhibits on the tropical rainforests and the scientific work occurring there), will be realized through the $16 million drive. The model will also contain the new Desert House, a future project that will tie the complex together visually and technologically. Look for this model to go on display toward the end of September.

Also look for our Climatron kiosks (currently in Grigg Hall at the entrance of the Ridgway Center) to go on traveling display beginning this fall. Many area shopping centers, banks, office buildings and other public places have agreed to take the exhibit. This will allow us to tell a larger audience of the Climatron's story and the importance of the tropics to the Midwest and the world.

In honor of their 50th wedding anniversary, the children of Elizabeth R. and Joseph F. Ruwitch Sr., above, presented one of Peter Smithers' photographs to the Garden. The picture is located in the Ridgway Center at the entrance to the Jordan Education Wing. The Ruwitchs had earlier contributed the peony garden in the Japanese Garden.

IN MEMORIAM / *Jules Gewinner*

We were saddened to learn of the death of Jules Gewinner in San Francisco on Sunday, June 7, at the age of 91.

Mr. Gewinner was a Garden volunteer who started in the Horticulture Answer Service in 1969 and transferred to the Library in 1972. His area of expertise was German translation, particularly German script, in which he translated letters to Dr. George Engelmann from his botanical specimen collectors throughout the West. Translators of German "Fraktur" or script are few and it is a skill that is highly valued. He received the Volunteer Emeritus award in 1985 in recognition of his important contribution.

From the Garden Gate Shop

Book Review: *Mudpies to Magnets*

Running low on ideas for keeping the kids busy? At the Garden Gate Shop, we have a variety of teaching manuals and activity guides that will help. The newest is *Mudpies to Magnets: A Preschool Science Curriculum* (Gryphon House, $12.95). This guide has 111 science experiments, including Seed Power, Pill Bug Palace, Sprouts and Ocean in a Jar. Each of these hands-on learning activities includes a list of appropriate vocabulary words to introduce a list of things you will need, a description of what to do and suggestions for follow-up activities. In addition, each activity is rated for particular age levels.

The authors of *Mudpies to Magnets*, Robert Williams, Robert Rockwell and Elizabeth Sherwood, are early childhood educators at Southern Illinois University-Edwardsville.

In addition to *Mudpies to Magnets*, a number of other activity guides are available at the Garden Gate Shop. They include *Hug A Tree* (Gryphon House, $8.95), *Experimenting With Plants* (Arco, $6.95), *Nature With Children of All Ages* (Prentice-Hall, $10.95) and *Snips & Snails & Walnut Whales* (Workman, $8.95).

SCHOLARSHIP ESTABLISHED

Through the generosity of several anonymous donors, the Garden will be able to offer a yearly $1,200 stipend to a female graduate student or postgraduate fellow who plans to do research in taxonomy and/or ecology. The gift is made in memory of Elizabeth Ammerman Baltzer who received her M.A. degree in botany from Washington University in 1939. She did much of her graduate research work and taxonomic studies at the Garden. Dr. Peter Hoch, coordinator of the Garden's Graduate Program, who will administer the award, said, "This is a wonderful opportunity to encourage young women to pursue careers in systematic botany and make a contribution to science."

Garden Receives Operating Grant

The Garden has received a $75,000 General Operating Support award from the Institute of Museum Services (IMS). The money will help meet operating expenses between July 1, 1987 and June 30, 1988. The award of $75,000 is the largest IMS makes individually.

Raven Among Those Honored by United Nations

Garden Director Peter H. Raven, has been selected as one of fewer than 100 persons and organizations worldwide to be named to The Global 500 by the United Nations Environment Programme (UNEP). The Global 500, an environmental honor roll, was inaugurated this year to celebrate June 5, World Environment Day. Names will be added annually through 1992 until 500 have been so honored.

As one of the first selected for the honor roll, Raven joins such prestigious names as the National Geographic Society, USA, David Attenborough, World Wildlife Fund, Sir Edmund Hillary, Public Service Broadcasting, USA, and Robert Redford.

A botanist who has been a strong advocate for conservation in developing tropical countries, Raven was selected for exemplary work in preservation and sustainable development of the global environment. Raven said, "It is extremely gratifying to be recognized by the UNEP, and to be considered among those groups who have a genuine concern for the world's environment."

For Younger Members

Trees

Do you have a favorite tree? Many people do. Maybe it is the tree in your backyard. Is it tall and shady and can you climb it in the summer? Or maybe your favorite tree is at the park or on someone's farm. The exact location of your tree isn't as important as it is to know that your tree plays an special role in making the earth a nice place to live.

Trees are an important part of the plant world. They are different from other plants in several ways. First they can be a lot taller than other plants. How many flowers do you see that are 80 feet tall? It's not unusual for trees to grow to that size.

Besides being some of the tallest plants in the world, trees are also some of the oldest. Scientists have recorded living trees that are over 2,000 years old. These trees are of course unusual, but a typical tree can easily live to be over 100 years old.

The structure of a tree helps it to achieve old age. Trees have a hard woody stem that supports about half the weight of the tree. Other kinds of plants having woody stems are bushes, roses and grape vines but these woody stems do not support as much of the weight of the plant.

All trees have leaves but they may not be the type of leaves that you usually think of when you picture a tree. Most people know what an oak tree looks like with its nice broad leaves, but did you realize a Christmas tree has leaves too? The leaves on a Christmas tree are the green needles growing on the branches. These two types of leaves help us identify two distinct categories of trees. The broad-leaf trees that lose their leaves in the winter months are called deciduous trees. The needle-leafed trees that stay green all year are conifers.

Leaves produce the food the tree needs to live. This process is called photosynthesis. The trees use the energy of sunlight, carbon dioxide in the air, and a green chemical called chlorophyll in the leaves to produce food. The chlorophyll is what makes leaves green. A byproduct of the photosynthesis process is oxygen. So while trees are making food for themselves they are also making oxygen for us to breathe.

In the fall the deciduous trees get ready for the winter by storing their energy in the sap. The leaves of deciduous trees slowly die in the fall as they stop the process of photosynthesis. As photosynthesis stops and the chlorophyll is no longer used, other colors in the leaves start to show through. This is why we have the brilliant fall colors in the woods.

Because trees are such interesting plants they are fun to study. Many people make leaf collections and practice tree identification. It can be fun to learn the names of your favorite trees. Knowing more about trees makes walking in the woods an exciting adventure.

TREE HUNT

Take a walk in the Garden, a local park or around your neighborhood and see if you can tell a deciduous tree from a conifer. Remember to look at the different shapes of the leaves. What kind of tree is it, if it has no leaves?

LEAF RUBBING

Collect several leaves from different trees. Try to get a variety of sizes and shapes. Use leaves that are still pliable and not brittle.

Arrange your leaves into an interesting pattern on your piece of cardboard. Place white paper over the leaves. Rub your color crayon over the area where the leaves are placed. The design of the leaf will show through on your paper.

LEAF COLLECTION

Making a leaf collection is simple and fun. You will need:

1. old phone book
2. leaf identification book
3. blank white paper, notebook paper
4. three-ring notebook
5. white glue

After you have collected leaves from your favorite trees lay them flat inside your phone book and allow them to dry completely. This will take approximately two days. This process is called "pressing" and will preserve your leaves for many years.

While your leaves are drying, write the name of each leaf, where you found it and the date on a piece of your notebook paper. After the leaves have dried glue them on the matching labeled paper and insert them into your three-ring binder.

WHAT IS A mobot?

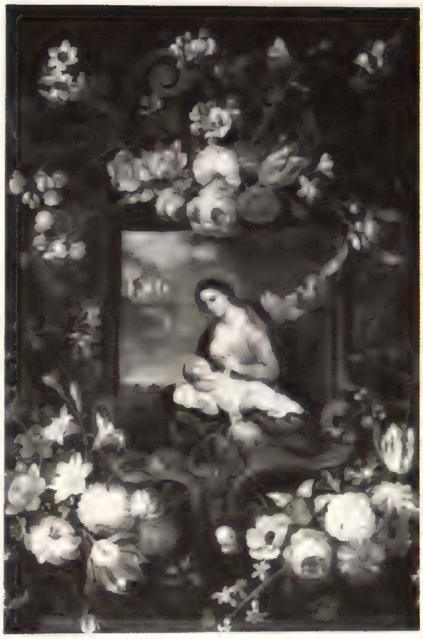
MoBot (mō'bŏt) noun: A junior member of the Missouri Botanical Garden.

Many MoBots make a club...the Mobot Club at Missouri Botanical Garden. The Club is a new way to enjoy the Garden. It's a club just for kids and just for fun. The Garden is a kid's place to have fun all year round. Enjoy fun events, movies, and explorations planned just for MoBots. Each MoBot will receive a MoBot T-shirt, a membership card and a MoBot Club newsletter. Kids can explore the Garden's fantasy land...the mysterious maze, the Japanese Garden, the jungle Climatron and everyone's favorite—the carp. While club members are having fun, they are also helping the Garden save plants from extinction, working for a better environment and making St. Louis a better place to live! Join today and find out what belonging is all about! (Use the application on the next page.)

Tower Grove House Quilt Contest

The Tower Grove House Auxiliary kicked off an Album Quilt Contest on July 24, to commemorate the birthday of the Garden's founder, Henry Shaw. Quilters may submit individually designed blocks that depict events relating to Henry Shaw or the Garden. Entries must be submitted by December 31.

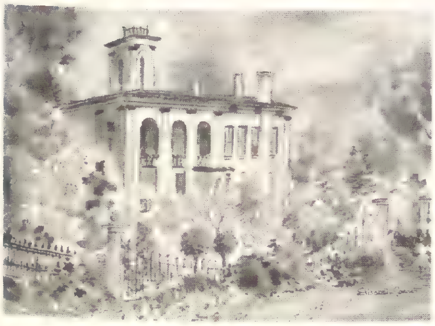
The best 32 squares will be selected in January with prizes awarded to the winners. In February, the panels will be assembled into a special Birthday Album Quilt in Tower Grove House and the finished product will go on display next September in Monsanto Hall along with other selected quilts. Entry forms and guidelines for the contest are available at the Ticket Counter.



Painting Restored at Tower Grove House

An oil painting in Tower Grove House once owned by Henry Shaw has been recently restored. The restoration of the painting, known as "Madonna and Child with Flowers," was carried out by Clements L. Robertson, chief conservator at The Saint Louis Art Museum. The work involved removing the old varnish and former restorations and relining, remounting and in-painting areas where the image was lost. The work was financed with proceeds from a benefit held by the Tower Grove House Historical Committee a couple of years ago. Several more works are also in need of extensive, and expensive, repair. If you are interested in helping with this ongoing project, please contact Tower Grove House.

Tower Grove House Notecards Available



The Historical Committee of Tower Grove House is now selling new notecards depicting a front and back view of Tower Grove House. Each reusable plastic packet holds 10 notecards and envelopes—five of each view. The price is $9.00 per packet.

The views are reproduced from original watercolor paintings by Elizabeth Carrott (Mrs. Clinton L. Whittemore, Jr.) of Quincy, Illinois. She attended the Art Institute in Chicago and Parsons in New York. She paints from impression, not giving an exact rendering of the subject. She puts her feeling into the painting. Mrs. Whittemore spends her summers in Wequetonsing, Michigan where she is artist-in-residence. She is represented in many private collections and has received numerous awards.

The notecards are for sale in Tower Grove House and the Garden Gate Shop.

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mobot CLUB APPLICATION

☐ I want to be a MoBot! ☐ Please enroll my brothers and sisters too! $15 per membership. Total memberships desired: ________

☐ My check for $________ is enclosed. ☐ Please charge to: ☐ MasterCard ☐ Visa Expiration date: ________

Account No. ________ Name as it appears on card: ________

MY NAME ________ BIRTH DATE ________

BROTHER(S) NAME(S) ________ BIRTH DATE ________

SISTER(S) NAME(S) ________ BIRTH DATE ________

ADDRESS ________ CITY ________ STATE ________ ZIP ________

PARENT'S NAME(S) ________ TELEPHONE (DAY) ________

SHIRT SIZE (Circle please) Children's sizes: 4-5 6-8 10-12 14-16 Adult size: Medium

Please make checks payable to: Missouri Botanical Garden.

Mail to: MoBot Club, Missouri Botanical Garden, Dept. 500046,
P.O. Box 66990, St. Louis, MO 63166-9910

Source Code ________
(Office use only)

MARCIA KERZ NAMED DIRECTOR OF DEVELOPMENT

Marcia M. Kerz has been named director of development for the Garden effective July 20. She replaces Patricia Rich who is leaving to open her own consulting firm.

Kerz's duties will include managing the Garden's fund-raising and membership programs. Since 1955 she has been president of Westminster Communications Inc. where she designed and managed fund-raising programs for nonprofit organizations.

"The Missouri Botanical Garden is one of the finest cultural institutions in the world, and has one of the largest membership bases found anywhere. I look forward to a long and fruitful relationship," said Kerz. "I'm very excited about the opportunity Dr. Raven has offered me."

Prior to Westminster Communications, Kerz was manager of the Harriett Woods for Lieutenant Governor of Missouri campaign in 1983 and 1984. She was executive director and project manager of the Conference on Education, a nonprofit statewide education organization, from 1980 to 1983, and legislative supervisor of the House Appropriations Committee for the Illinois House of Representatives in 1978 and 1979.

Kerz did post-graduate work in business and education at St. Louis University and University of Missouri-Columbia. She received Master and Bachelor of Science in Education degrees from Illinois State University.

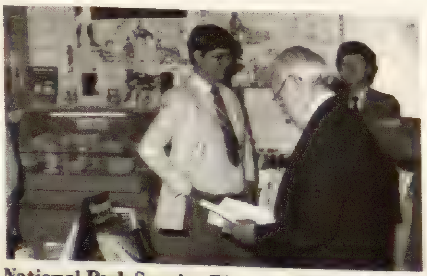
Raven Honored by Florida State Museum

Dr. Peter H. Raven, director of the Garden, received the Florida State Museum's Archie F. Carr medal on May 15, in Gainesville, Florida. Dr. Raven received the medal from Dr. Robert Bryan of the University of Florida in a ceremony on the university's campus. After receiving the award, Dr. Raven presented a talk entitled "Population, Poverty and Politics in the Tropics." The evening concluded with a reception at the Florida State Museum.

The Carr Medal honors Archie F. Carr, former University of Florida zoology professor and world authority on sea turtles. Dr. Carr was affiliated with the university for 55 years, during which he compiled the first comprehensive list of Florida's reptiles and amphibians and frequently led worldwide expeditions. The Carr medal recognizes outstanding national and international contributions to the knowledge and understanding of man's national heritage. The medal is awarded every three to five years. Dr. Carr died in the spring of this year.

Carol Unger Elected

Carol A. Unger, director of personnel, has been named president-elect of the International Association for Personnel Women (IAPW), effective May 1988. Unger has also recently been named president-elect for the Human Resource Management Association, the St. Louis Chapter of the national organization, the American Society for Personnel Administration.



National Park Service Director William Penn Mott visited with Garden staff in May while in St. Louis. Shown here at the Americas National Parks store in Union Station are Dr. George Rogers, left, Mott, and Dr. Marshall Crosby.

Trustee Profile

PEG OBERHEIDE

Cutting the asparagus in her father's vegetable garden was one of Peg Grigg Oberheide's jobs as she was growing up in Clayton. Her father was an avid gardener and brought her to the Garden often. This is one of the reasons why she and her family contributed benches around the lily pond in his memory. From coming to the Garden as a child to being involved with the Shaw House Cook Book to being on the Board of Trustees, the Garden has been a thread throughout her life.

Perhaps best characterized as someone who really loves her community and wants to give back to it, she has been involved in many of St. Louis' cultural institutions. In the Campaign for the Garden, she feels that the Climatron is the most important of the projects. She believes that much of St. Louis identifies the Garden with the Climatron and it is a very important attraction. She enjoys being a Trustee because it is the best way to be on the "inside" of all of the many activities and projects at the Garden.

She feels that the Ridgway Center has made an enormous difference at the Garden and that it is that building that spurred her recent interest. Grigg Hall, which she donated in memory of her late husband, Hamblett Charles Grigg, is the main entry to the Ridgway Center and the Garden. When friends ask her about the Garden, she quickly tells them it is "the finest garden in the world" and admits that she "brags about it all the time." St. Louis and the Garden are lucky to have her interest and support.

◄
Receiving silver platters commemorating 15 years of service on the Board of Trustees from President John H. Biggs, left, are Sidney M. Shoenberg Jr. and Daniel L. Schlafly. Garden Director Peter Raven is second from right.

Left Turn Permitted

Getting to the Garden should be even easier for many visitors now that the City of St. Louis has installed a left turn lane and signal on Kingshighway southbound at the Vandeventer/Southwest intersection.

Tributes MAY-JUNE 1987

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continued on next page

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Plants To Remember

Phyla scaberrima

Researchers have discovered it's sweeter than sugar, but will it tickle your tastebuds?

Sugar is fattening and causes cavities, and its well-known alternatives have drawbacks: health concerns, aftertastes, bitterness, and expense. The world will welcome better sweeteners, and the search is on. One approach is to comb literature and other records to uncover obscure uses for plants. A group of researchers at the University of Illinois did this with documents on Mexican plants and found a species worthy of testing (or tasting).

In the *Natural History of New Spain*, written in the 1570s by the Spanish doctor Francisco Hernández, the researchers came upon the Indian plant name *Tzonpelic xihuitl*, which means "sweet herb." They connected the old reference with the species now known as *Phyla scaberrima* (formerly *Lippia dulcis*), a member of the sizable verbena family (Verbenaceae) along with verbenas, chaste trees, and lantanas.

The research group obtained *Phyla scaberrima* from Mexico and investigated it chemically as well as gustatorily. They discovered that the chief sweet component is an oily compound, which they named hernandulcin to honor Dr. Hernández (the -dulcin ending comes from Latin, *dulcis*, for "sweet"). Tests for toxicity were negative, so they presented hernandulcin to a panel of tasters for comparison with sugar. The panel pronounced hernandulcin sweeter by far, but not free of aftertaste. Whether or not it will ever tickle your tastebuds remains to be seen. Hernandulcin is under consideration by two companies for use in toothpaste and mouthwash. Certain benefits of the discovery are insights into the chemistry of sweetness.

You can enjoy seeing and sniffing this pleasant reminder that protecting and researching wild plants pays off. *Phyla scaberrima* will be displayed in the Herb Garden and in the Scented Garden this autumn and next summer at the Missouri Botanical Garden. —*George Rogers*

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Missouri Botanical Garden

BULLETIN

Celebrate the
HOLIDAYS
AT SHAW'S
GARDEN

VOLUME LXXV, NUMBER 7
NOVEMBER-DECEMBER 1987

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The Garden comes alive with the sights, sounds and smells of the holidays highlighted by a unique display in Monsanto Hall.

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The BULLETIN is sent to every Member of the Garden as one of the benefits of membership. For a contribution of as little as $35 per year, Members also are entitled to: free admission to the Garden, Shaw Arboretum, and Tower Grove House; invitations to special events and receptions; announcements of all lectures and classes; discounts in the Garden Gate Shop and for course fees; and the opportunity to travel, domestic and abroad, with other Members. For information, please call (314) 577-5100.

Postmaster: send address changes to Lee B. Fox, editor, BULLETIN, P.O. Box 299, St. Louis, MO 63166.

Comment

Building for the Future

The Campaign for the Garden, our capital plans to rejuvenate the Climatron and construct a new Temperate House and Interpretive Center, replace our 75-year-old greenhouses, and build the pavilion in the Center for Home Gardening, continues to reach new heights. I am pleased to announce that we are almost at the $9 million mark and much of our recent energies have concentrated on the Climatron Complex. At the Henry Shaw Associates Dinner in September, we unveiled the Climatron Complex model, which offers a wonderful opportunity to see first-hand the Temperate House, replacing the present Mediterranean House, the Interpretive Center behind the Climatron, and the new Desert House, which is not part of this campaign effort.

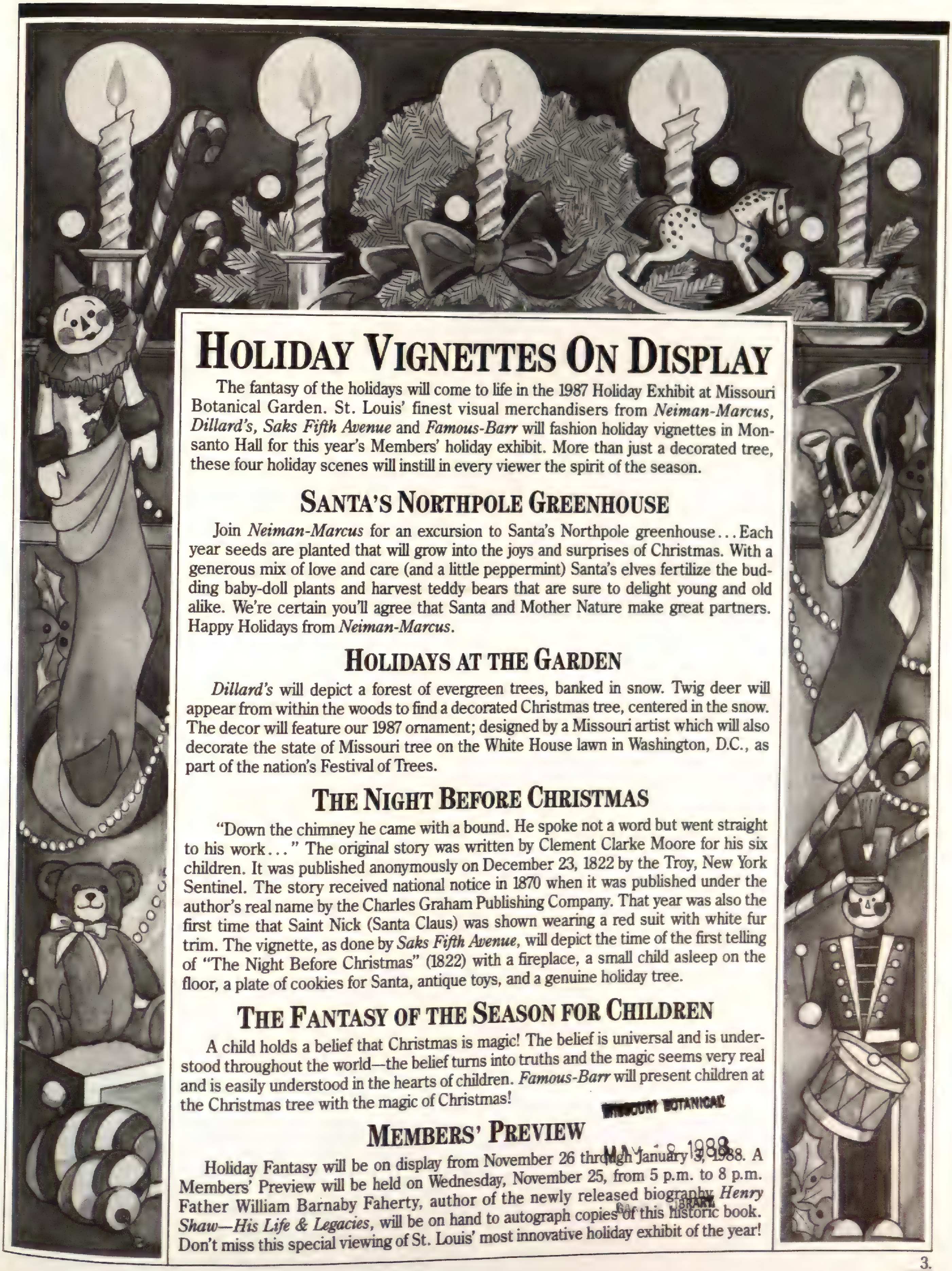
The Climatron exhibits, which you can read more about on page 4, are moving beyond the initial planning stage. Active educationally-oriented displays, such as an exhibit of falling logs, demonstrating the variety of useful purposes these can serve in the forest, is just one example of our efforts to provide interpretive materials and activities oriented towards children and family groups.

Before the end of the year, our Henry Shaw Fund committee will contact each member of the Garden about our annual giving program. The Henry Shaw Fund supports the annual operating expenses of the Garden and the need is ongoing. Garden programs, services, and displays are maintained through the generous gifts of Henry Shaw Fund donors to benefit all of our Garden visitors. Gifts to this fund make it possible to ensure that the Garden remains the best at what it is and does.

As we approach the conclusion of 1987, it's exciting to know that the Garden is moving ahead. Attendance, membership, and enrollment in our educational programs are all exceeding last year's count. It's obvious that the unending support from all of our Members and from the entire St. Louis community will ensure continued success in our capital drive. And through your assistance at any level in our annual giving program, you become the margin of excellence that enables the work of the Garden to flourish.

Peter H. Raven

Garden Director Peter Raven, right, and the Tower Grove House Historical Committee recently honored Ruth Culver, above left, for more than 36 years of service to Tower Grove House and the Garden. Mrs. Culver was one of a handful of people who restored Henry Shaw's country home to its original splendor in the 1950s and has held a variety of posts, including serving as chairman, with the Historical Committee over the years.



HOLIDAY VIGNETTES ON DISPLAY

The fantasy of the holidays will come to life in the 1987 Holiday Exhibit at Missouri Botanical Garden. St. Louis' finest visual merchandisers from *Neiman-Marcus, Dillard's, Saks Fifth Avenue* and *Famous-Barr* will fashion holiday vignettes in Monsanto Hall for this year's Members' holiday exhibit. More than just a decorated tree, these four holiday scenes will instill in every viewer the spirit of the season.

SANTA'S NORTHPOLE GREENHOUSE

Join *Neiman-Marcus* for an excursion to Santa's Northpole greenhouse . . . Each year seeds are planted that will grow into the joys and surprises of Christmas. With a generous mix of love and care (and a little peppermint) Santa's elves fertilize the budding baby-doll plants and harvest teddy bears that are sure to delight young and old alike. We're certain you'll agree that Santa and Mother Nature make great partners. Happy Holidays from *Neiman-Marcus*.

HOLIDAYS AT THE GARDEN

Dillard's will depict a forest of evergreen trees, banked in snow. Twig deer will appear from within the woods to find a decorated Christmas tree, centered in the snow. The decor will feature our 1987 ornament; designed by a Missouri artist which will also decorate the state of Missouri tree on the White House lawn in Washington, D.C., as part of the nation's Festival of Trees.

THE NIGHT BEFORE CHRISTMAS

"Down the chimney he came with a bound. He spoke not a word but went straight to his work . . . " The original story was written by Clement Clarke Moore for his six children. It was published anonymously on December 23, 1822 by the Troy, New York Sentinel. The story received national notice in 1870 when it was published under the author's real name by the Charles Graham Publishing Company. That year was also the first time that Saint Nick (Santa Claus) was shown wearing a red suit with white fur trim. The vignette, as done by *Saks Fifth Avenue*, will depict the time of the first telling of "The Night Before Christmas" (1822) with a fireplace, a small child asleep on the floor, a plate of cookies for Santa, antique toys, and a genuine holiday tree.

THE FANTASY OF THE SEASON FOR CHILDREN

A child holds a belief that Christmas is magic! The belief is universal and is understood throughout the world—the belief turns into truths and the magic seems very real and is easily understood in the hearts of children. *Famous-Barr* will present children at the Christmas tree with the magic of Christmas!

MEMBERS' PREVIEW

Holiday Fantasy will be on display from November 26 through January 3, 1988. A Members' Preview will be held on Wednesday, November 25, from 5 p.m. to 8 p.m. Father William Barnaby Faherty, author of the newly released biography *Henry Shaw—His Life & Legacies*, will be on hand to autograph copies of this historic book. Don't miss this special viewing of St. Louis' most innovative holiday exhibit of the year!

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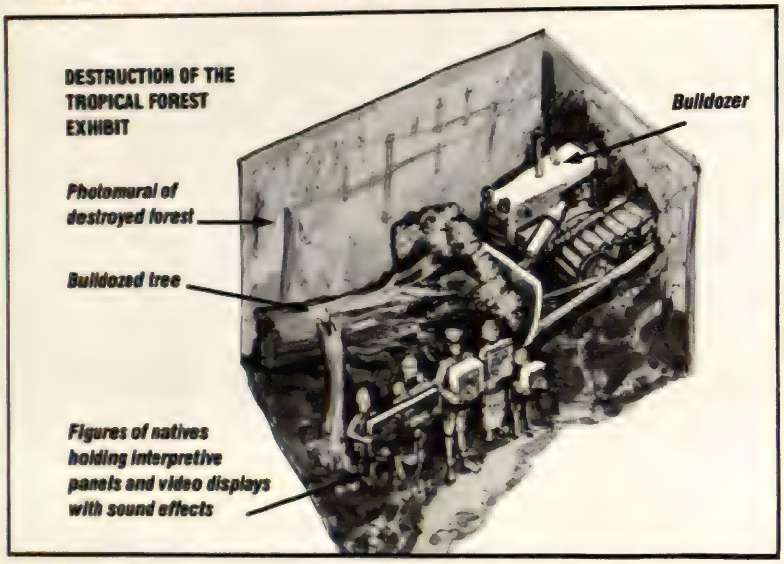
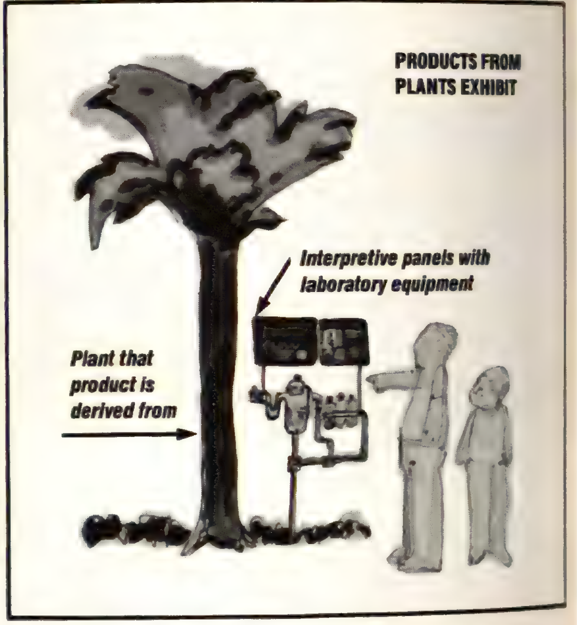
THE CLIMATRON RENOVATION/NEW EXHIBITS INTERPRET THE TROPICS



DESTRUCTION OF THE TROPICAL FOREST EXHIBIT

Bulldozer
Photomural of destroyed forest
Bulldozed tree
Figures of natives holding interpretive panels and video displays with sound effects



PRODUCTS FROM PLANTS EXHIBIT

Interpretive panels with laboratory equipment
Plant that product is derived from

BY EILEEN ZALISK

Project Manager and Programmer, Krent/Paffett Associates, Inc.

Residents of St. Louis and the nation have enjoyed the tranquil beauty of the Climatron since it opened in 1960. The Climatron has been considered more of an aesthetic experience than a place to learn and understand but that is about to change. This change will involve not only what the Climatron looks like but the way visitors look at the Climatron. The goal is to retain the aesthetic experience and enhance it with the introduction of special exhibits. The exhibits will occur in two places: the Climatron itself and the Interpretive House to be built in an adjacent space.

The process of developing exhibits for the Climatron began over a year ago when Krent/Paffett Associates, Inc. of Boston was hired to design the exhibits. Work began in January, 1987 and from the start several things were clear.

The primary goal was to retain the beauty of the Climatron while heightening visitors' understanding of it. This would include two separate aspects. First, to create an exhibit which enabled visitors to learn more about what they were seeing; and secondly to impress visitors with the urgent message about the progressive destruction of the tropical rainforests and its global implications. In addition, another goal was to develop exhibits in the Climatron that would be exciting, accessible to children and adults but designed with an appreciation of the existing environment of the Climatron.

In developing plans for the Climatron and Interpretive House, emphasis was placed on the accuracy of scientific and botanical content. We drew heavily on the writings and references of Dr. Peter Raven and other botanical experts. The challenge was then to transform the information and the message into exhibit and graphic form.

A key word in developing science centers (including botanical gardens) today is interactive. This contradicts the traditional approach in which most museum exhibits were protected in display cases. The interactive approach invites visitors to pick up and handle things—to learn about basic principles by making observations—even doing experiments. The success of interactive exhibits dictates that some hands-on exhibits would have to be carefully integrated into this very special space. We wanted to be sure that our exhibits were exciting, educational, sensitive, and just plain fun.

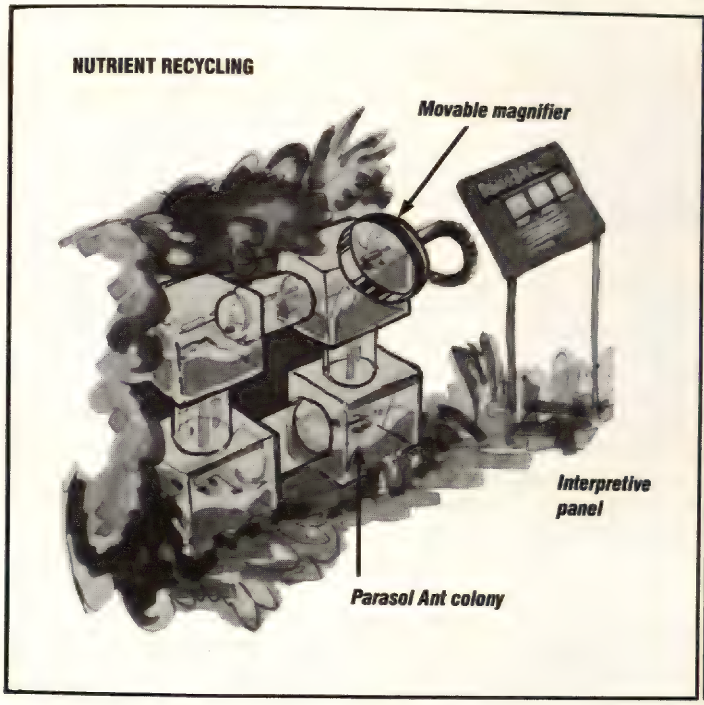
The result, at the end of the schematic design phase, has been a plan for exhibit content and design. The plan for content gives priority to communicating the urgent message of the destruction of the tropical rainforests and raising the level of scientific and botanical information presented to the general public. The plan for design includes an intelligent and affordable mix of interpretive and interactive exhibits which are integrated into the existing landscape in a subtle but compelling way.

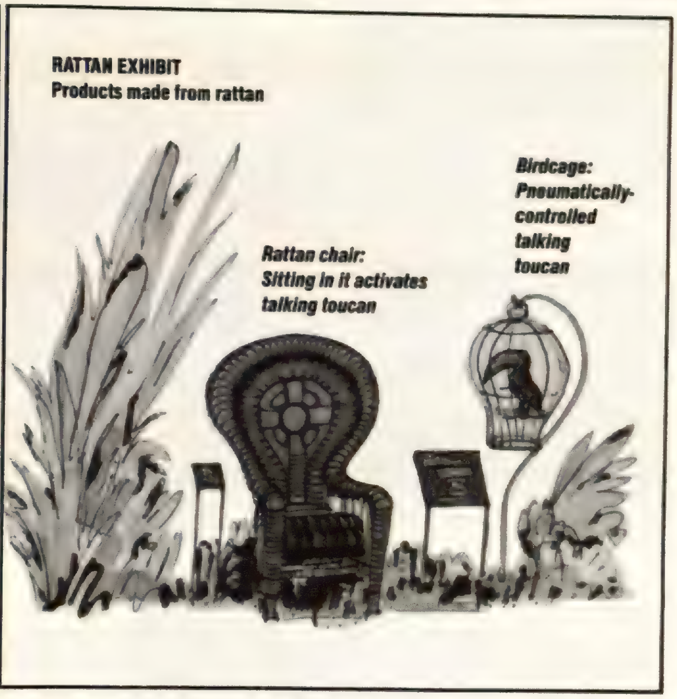
Visitors entering the Climatron will be introduced to the issues of the tropical rainforest in an elegant and beautiful way. A simple graphic/photographic presentation evoking the actual forest with silent text will provide a time for reflection. The message will be simple and global. Tropical rainforests comprise ten percent of the earth's surface and are home to one half of its species; tropical rainforests are so diverse that many of their species have not yet been discovered; the rate of destruction of tropical rainforests is increasing—at the current destruction rate these rainforests will disappear in 60 years.

As visitors proceed into the Climatron, they will come to an introductory exhibit explaining what the Climatron is and how it relates to the tropical forest. The exhibit will serve to orient the visitor to the Climatron space. In addition to these entry experiences, three major exhibits will focus on important elements in the Climatron and will be located adjacent to appropriate plantings.

• Fallen Log Exhibit (When a Tree Dies)

This exhibit describes what happens when a tree dies and falls to the forest floor. It focuses on how anything that falls to the floor is used quickly and recycled through the system. A series of panels describe the steps in decomposition and the return of the nutrients to the forest. This exhibit also includes a living, multichambered, parasol ant colony, with a movable magnifier, which describes the life cycle and interaction of these ants. In addition, a shallow cutaway window allows visitors to observe and learn about life


NUTRIENT RECYCLING


RATTAN EXHIBIT
Products made from rattan
Rattan chair: Sitting in it activates talking toucan
Birdcage: Pneumatically-controlled talking toucan

below the tropical forest floor, including critical mycorrhizal associations and how they reveal a cooperative approach to getting energy and nutrients.

• The Talking Orchid Learns to Drink Exhibit This exhibit presents the story of epiphytes, and orchids in particular, in a creative and amusing way. Epiphytes, visitors will learn, are plants that grow upon plants and include orchids, bromeliads and arboreal cacti. Epiphytes, which have no contact with the ground, have developed special systems to collect and hold water as well as to reduce water loss. In this exhibit, a replica of an orchid plant with hidden speakers is the main focus. The plant has a clear plastic root which is a low suction tube that can drink water from a visitor's hand. The water is provided in a nearby fountain or pool. This highlights important points about epiphytes, which are further developed in adjacent interpretive materials.

• Products From Plants Exhibits These occur in an area of the Climatron with primarily economic plants and present the economic use of plants. One exhibit emphasizes the scientific and pharmaceutical uses of tropical rainforest plants. Here lab-type fixtures are attached to a particular tree or plant, symbolically drawing the useful medicine from it.

Another Product from Plants exhibit focuses on food from the tropical forests. An old fashioned 1-cent candy dispenser allows visitors to taste and purchase edible plant products from adjacent trees. Nearby, a Rattan exhibit presents the uses of rattan with a hint of nostalgia in the form of an old fashioned Victorian era rattan chair. Visitors sitting in the chair will activate an audio program controlling a talking toucan, which lives in an adjacent rattan cage. These Products from Plants exhibits will be supplemented by additional interpretive information about the many medicines, oils, waxes, fibers, and foods which owe their existence to the raw materials of the tropical forest.

In addition to these major interactive exhibit elements, a series of simple interpretive elements will present information along the Climatron way.

THE INTERPRETIVE HOUSE

Leaving the Climatron, visitors will enter the Interpretive House being developed as a new facility architecturally unique but consistent with the Climatron. Here a large three-dimensional diorama will present the destruction of the tropical rainforests in a dramatic way. The mural will include a bulldozer, with sound effects, uprooting a tree. Full sized statues of people involved in the study present interpretive information. For example, a television set held by one of the statues will present before and after video segments of the destruction of a tropical forest.

The Tropical Forest Destruction diorama will be surrounded by an interpretive exhibit to explain how and why tropical forests are being destroyed. The exhibit will also point up the many ways in which we are affected by the destruction of the tropical rainforests. Finally, the interpretive material will include a Ray of Hope exhibit element, letting visitors know what can be done to save the tropical rainforests.

Throughout our work in this schematic design phase of exhibit developments we have tried to keep our initial goals in mind. The development of exhibits for the Climatron and Interpretive House has been a cooperative effort between our firm, Krent/Paffett Associates, Inc. as designers, Dr. and Mrs. Raven, Director of Horticulture Alan Godlewski and the Missouri Botanical Garden staff; The Christener Partnership, designers of the new Interpretive House; and Geoffrey Rausch of Environmental Planning and Design, the master planners of the Garden. Their ideas, attitudes, and inspiration have helped us every step along the way.

Visitors to the renovated Climatron and new Interpretive House will see an exciting and memorable presentation of the tropics. The exhibits we've described and additions planned for the future will meet the Missouri Botanical Garden's goal of expanding the visitor's experiences and communicating an urgent message in an unforgettable and enriching way. ■

Gardening at the Garden

Hollies

Ilex opaca 'Mae'

HOLLIES are such irresistible winter highlights that it is not surprising that they cheered winter-weary peoples long before anyone wrote about them. As related by H. Harold Hume in his enjoyable book "Hollies," the ancient Romans decorated with holly during the Saturnalia, a festival for Saturn held at about the winter solstice in late December. The early Christian leaders disapproved of the Saturnalia, since it was a (not particularly tasteful) pagan celebration, so they prohibited using the holly associated with it as a Christmas adornment. Rules are not always obeyed, and evidently holly became a component of Christmas cheer at a very early date.

The Romans invaded Britain in 55 B.C. and probably brought the idea of holly as a mid-winter decoration with them. The British invaded Plymouth, Massachusetts in 1620 and likewise no doubt brought the practice with them. This would have been especially easy, since our standard wreath holly (*Ilex opaca*), which resembles the beloved English holly (*Ilex aquifolium*), reaches its northern wild limit virtually at Plymouth. American Indians enjoyed the beauty of holly before Europeans brought Christmas.

Indians hardened *Ilex opaca* fruits to preserve the color and used them as bright beads, even as items of commerce. Branchlets were worn attached to clothing at times, and holly leaves were painted onto garments and other objects. In Indian symbolism this species stood for fierceness (the spines on the leaves), toughness (the strength of the wood), and steadfastness (the evergreen foliage). They planted hollies around dwellings for protection from undesirable spirits. I don't know if hollies are effective against spirits, but a dense planting of them does slow more fleshy beings.

Folklore and customs centered on holly in Europe are as extensive as might be expected for a species tied to human culture for over two thousand years. As with many other plant groups, some of this carried over to the American species. Themes running through holly lore have to do with protection from evil and lightning, household fortune depending on the circumstances of the Christmas holly display and its removal, and foretelling the future, particularly in relation to future spouses.

The countless historical remedies based on hollies range from cures for toothache to treatment of chilblains. The applications were as simple as brewing the leaves in teas or so troublesome as splitting the trunk, shoving the patient through the split, and then watching the person and tree heal simultaneously. This is an example of a practice that migrated from Europe to the New World; there may still be hollies in this country showing scars from such splitting. *Ilex aquifolium* was once a raw material in Britain for making a goo called birdlime used like flypaper for capturing sparrows to be baked into a pie. More practical uses concern the wood: variously stained, that of *Ilex aquifolium* and *Ilex opaca* is esteemed for inlay work.

Wild *Ilex opaca* is confined to the southeastern quarter of the U.S. with an extension up the East Coast. In Missouri it is found on and around Crowley's Ridge, a curious rocky spine cutting cross the otherwise flat bootheel portion of the state. The best places to observe it at the Garden are at the north end of the new Jenkins Daylily Garden, where there are a few especially handsome individuals; east of the Lehmann Rose Garden, where a holly grove extends to the main walkway; and between the Museum and Administration buildings. The last-named area is home to about 20 cultivars. My favorites among these are:

Ilex opaca 'Mae'—The slender, spire-like shape and rich display of red fruits will help you spot our best specimen just north of the Administration Building. The ancestral tree of this cultivar was noticed wild in a New Jersey woods. Other holly cultivars have started with outstanding cultivated individuals that were noticed: *Ilex opaca* 'Chief Paduke' descends from a tree in a Paducah, Kentucky cemetery.

Ilex opaca 'Canary'. This showy, yellow-fruited cultivar would be lost among other hollies near the east wall, east of the Herb Garden, but its tall, evenly conical form rises proudly above the crowd. 'Canary' was developed,

American hollies by the Administration Building

***Ilex vomitoria* in the Linnean House**

among other older cultivars, by Earle Dilatush, an early leader in holly horticulture.

Ilex opaca 'Wilfrid'. Most cultivated hollies are either male or female with the consequence that for good fruiting most females require association with pollen-producing males. 'Wilfrid' is such a male, although close inspection will reveal a few fruits on him. A large individual enhances the lawn east of the new Kaeser Maze. Probably the most extensively grown opaca male is 'Jersey Knight' (also dubbed "Brown No. 9"). It arose as a wild variant in New Jersey on land belonging to a Judge Brown. An example is located conveniently near the 'Mae' mentioned above.

The discussion so far has pretended that "holly" is synonymous with our familiar *Ilex opaca* and its European counterpart. The time has come to broaden the picture, even if in 1987 the picture remains a little out of focus. The genus *Ilex* is distributed worldwide in tropical to temperate regions. Estimates of its size span the range of 350 to 700 species. About 40 species were discovered in China alone in the early 1980s. Garden botanist Julian Steyermark has recently investigated some South American members of *Ilex*. Approximately 20 species are widely cultivated; roughly that many occur naturally in North America; and three native species inhabit Missouri.

Of the Missouri species, the evergreen *Ilex opaca* has already been covered. The other two are deciduous but showy in winter thanks to their abundant and colorful fruits. Winterberry (*Ilex verticillata*) ranges across much of eastern North America on acid, wet soils. Under good circumstances it can be a scarlet mound and has some commercial value for dried, colorful sprigs. A large, fairly new patch of *Ilex verticillata* 'Winter Red' is at the very northern end of the Japanese Garden on the backside of the ridge. Fairly similar, possum haw (*Ilex decidua*) enlivens roadsides in southern Missouri as well as spots in the Garden with sprays of reddish to orangish fruits. See it near the Museum and Administration buildings and at Shaw Arboretum.

To return briefly to American Indians, a species on display in the Linnean House was the main ingredient in a favorite ceremonial beverage. Yaupon holly, also called cassine (*Ilex vomitoria*), and indigenous to the Southeast, was brewed into a stimulating tea known as the black drink or as *casseena*. Indians gathered from great distances on the Coastal Plain each spring to participate in *casseena* ceremonies. The Latin name for the species reflects the hazard that *casseena* consumed in quantity induces vomiting. The stimulating component turned out to be caffeine, which raises the question as to whether caffeine occurs in other species of *Ilex*.

The answer is yes. About 60 species are consumed in various regions as teas, which hints that caffeine is widespread in the genus. One species confirmed as containing caffeine is culturally and economically significant in southern South America. *Ilex paraguariensis* is the source of the beverage *"mate"* or *yerba mate* a daily pleasure especially in Argentina and Paraguay. Visit the Climatron to see *mate* just north of the main door. On the opposite face of the globe in and near Tibet, *Ilex yunnanensis* var. *eciliata* has a similar role. The stimulating properties of *Ilex* species probably lie in part behind their prominence as folk remedies.

Hollies hybridize, and this augments their horticultural appeal. In the Herb Garden can be found several individuals of *Ilex ×attenuata*, the only known naturally occurring cross between North American species. Its parents are *Ilex opaca* and dahoon holly (*Ilex cassine*) of the southern Coastal Plain. A cross of considerable horticultural and commercial significance took place in 1964 in New York State: *Ilex ×meserveae* resulted from hybridizing English holly with the eastern Asian prostrate holly (*Ilex rugosa*). Thus originated the "Blue" series of cultivars, including 'Blue Boy' (male), 'Blue Girl' (female), 'Blue Princess', and 'Blue Prince'. Of low stature, attractively blue toned, evergreen, capable of ample fruit production, and very hardy, these have found niches in the Garden. 'Blue Boy' and 'Blue Girl' are readily located north of the Administration Building, as is a major planting of 'Blue Prince' around Spoehrer Plaza near the Lehmann Center.

Limitations of space and the human attention span prohibit lengthy discussion of the remaining *Ilex* species displayed at the Garden. They are of interest in part because they do not look like "hollies" (that is, they do not look like *Ilex opaca* or *Ilex aquifolium*). Inkberry (*Ilex glabra*), a North American native evergreen that is popular with bees and that has long, narrow leaves and usually black fruits, is most easily viewed in front of and west of the Lehmann Center and along the border between the Woodland and Japanese gardens. It is often confused with Japanese holly (*Ilex crenata*), which differs by having shorter leaves with more teeth around the margins (the teeth in inkberry are few and confined to the tip). *Ilex crenata* 'Convexa' hedges can be viewed in the Gladney Rose Garden and at the southern end of the Japanese Garden. Garden horticulture chairman Alan Godlewski reports that these have performed well except for some damage in particularly bad winter weather. In the new extension of the Woodland Garden four young specimens of *Ilex sugerokii* look promising. This planting is of special interest because it traces back to seeds collected from wild plants in the mountains of Japan. *Ilex sugerokii* is only rarely cultivated in the U.S.

An article on the Garden's hollies would have been much more difficult to prepare without good records. For these, much gratitude is due to Garden volunteer Sara Moore for hours of inventorying the holly collection, this leading to improvements in the labeling. Please help justify all of Sara's holly-inflicted wounds by visiting the Garden this winter for a looksee at the hollies.

George Rogers, Ph.D.

The
CAMPAIGN
for the Garden

UPDATE: New Greenhouses Take Shape

Workmen preparing new foundation

As of September 15, 1987, the $16 million Campaign for the Garden has raised $8,911,030 in gifts and pledges, well over one-half way toward the goal. We thank those donors whose generosity helped us reach this very important point in our fundraising progress.

• • •

A long-time dream of the Garden's horticulture staff is now one-third complete, as finishing touches are put on the new greenhouse range for the Garden's world-class collection of orchids and bromeliads. The first construction project in the campaign is the replacement of ten antiquated production greenhouses (now completely demolished) with ten modern, efficient growing bays, at an overall cost of $2.6 million. The orchid range was the first of the three ranges to be reconstructed, and in June, the Garden's approximately 8,000 orchids and 500 bromeliads were moved back to permanent, greatly improved quarters.

"It's impossible to describe the boost these new buildings will give our growing program," said Alan P. Godlewski, the Garden's director of horticulture. "The old houses served us well for decades, but growing technology has become very sophisticated since they were built in 1914. We found it more and more difficult to work around their limitations and the problems created by their aging. We grow and maintain hundreds of thousands of plants each year, on very strict timetables because we change displays so frequently—those old houses just couldn't keep up anymore."

Inside the new orchid range

The differences between the old and new structures are dramatic. The previous orchid range was made up of five small, separate greenhouses connected at their ends. This set up created inefficient space usage and a large exposure of exterior surface, causing widely fluctuating temperatures and substantial energy losses.

The new orchid range contains three large growing bays sharing common walls, each tailored to the needs of orchids from diverse regions (orchids can be found in most areas of the world, except for the frozen north, with different types adapting to extremely different environments). The Garden's collection began as an outgrowth of its first major botanical field research program in Panama in the 1920s. In years since it has become one of the world's largest and most varied collections. The three bays maintain "cool" orchids (native to regions where temperatures sometimes approach freezing, such as mountain forests), "intermediate" (native to moderate climates and elevations) and "warm" (native to warm, humid climates typically located at sea level). The range also contains a large, cool, corridor-like holding bay to store and "finish off" plants as they reach peak bloom, at which time they will move into floral displays. "Thanks to superior benching systems now in place, we have increased our plant holding capabilities by 20 to 25%, though the square footage has increased only slightly over the old houses," said Godlewski.

The Garden is not alone in its efforts to deal with antiquated greenhouse systems. In America and Europe, botanical and estate gardens are renovating, replacing or adding to their production facilities; the Royal Botanic Gardens (Kew, England), The New York Botanical Garden, the Chicago Botanic Garden and the Palmgarten in Frankfurt, Germany, are a few prime examples. The Missouri Botanical Garden's new structures make use of standard North American greenhouse technology, with elements appropriate to general and/or special plant needs.

The new greenhouse construction could begin this year thanks to early gifts to the capital campaign. Workmen are now pouring the basement walls and footings for the second range, to house the Garden's special collections of tropical water lilies, cacti, succulents, and such seasonal show plants as chrysanthemums and poinsettias.

General Dynamics Pledges Major Gift to Capital Fund Drive

The General Dynamics Corporation has made a $300,000 pledge to the $16 million Campaign for the Garden. General Dynamics, based in St. Louis, is one of the area's major employers and has numerous operating divisions and subsidiaries from coast to coast.

Peter H. Raven, the Missouri Botanical Garden's director, praised General Dynamics' civic-mindedness and generosity to one of the Garden's most important fund-raising campaigns in years. "This gift is a very real investment in the future of St. Louis and we are delighted with their interest and enthusiastic support." The pledge will be paid over five years.

A BOTANICAL LIBRARIAN'S VIEW

The Soviet Union

The *other* MBG, the Main Botanical Garden, Moscow, was our introduction to a new world of botanical gardens and libraries. Traveling with me were Lydia Newcombe, of the Rancho Santa Ana Botanic Garden, and John Reed, of The New York Botanical Garden. Our plan included traveling 23 days to Moscow, Leningrad, and Novosibirsk to visit ten Soviet Union libraries that handle botanical literature.

Our goal was to determine ways to increase holdings of Soviet botanical literature by U.S. botanical garden libraries. We wanted to accomplish this goal by establishing contacts with Soviet librarians, while also learning more about Soviet publishing patterns and how Soviet exchange programs work. Our trip was organized through the U.S.A.-U.S.S.R. Environmental Protection Agreement under which the United States and the Soviet Union have been exchanging botanists and other plant science specialists since 1976. Thomas S. Elias, director of Rancho Santa Ana Botanic Garden, Claremont, California, is the American coordinator, and the Main Botanical Garden of the U.S.S.R. Academy of Sciences, Moscow, is the Soviet coordinating center.

Lydia Newcombe, John Reed, and Connie Wolf pose in Red Square.

Plans for the trip were made through the Main Botanical Garden in Moscow. The Main Botanical Garden, like the Komarov Botanical Institute in Leningrad and the Central Siberian Botanical Garden near Novosibirsk, is a plant science research center for the U.S.S.R. Academy of Sciences. Compared to U.S. libraries, Soviet libraries operate under a far more centralized system, with most libraries being a part of a larger system. Because the majority of the botanical literature is published through the U.S.S.R. Academy of Sciences, our trip focused on the three central Academy libraries and their associated institute or garden libraries. In addition, we visited two libraries of the U.S.S.R. Agricultural Academy, the State Lenin Library, and the Library of Moscow State University.

Tatiana (Tanya) Zaitseva, a botanist at the Main Botanical Garden, greeted us in English at the Sheremetyevo Airport. Tanya accompanied us throughout the trip, providing introductions and translation services for us. My experience with the Russian language had included private lessons, listening to tapes, and hours of studying. Every bit I had learned became useful, especially in figuring out book titles in the numerous book stores we visited and when I took off on my own to explore Moscow. When no translator was available, I found that my Russian skills, a dictionary, body language and persistence almost always produced the desired results.

One of the most interesting places we visited was the Main Botanical Garden. Its almost 900 acres include forest areas, plant exhibitions, greenhouses, an exquisite Japanese garden, and an administration building that houses the library. As with other Soviet libraries, the Main Botanical Garden library has difficulty obtaining foreign literature, mainly because of problems with currency exchange.

In addition to the gardens and libraries, it was exciting just being in the Soviet Union. The architectural contrasts between the magnificent churches built

continued on next page

Interior of the library at the Academy of Sciences, Leningrad.

A young boy stands on the Soviet's version of the Yatsuhasi Bridge at the Main Botanical Garden, Moscow.

Garden horticulturist Jim Henrich, left, shows visiting Soviet botanist Pyotr Gorovoy asters sent by the Soviets for propagation in St. Louis.

by the czars and the buildings built after the Revolution, the efficient underground rapid transit system, the people who seemed so different from us and yet so much the same—each heightened even the most ordinary experience. Especially striking was the spirit of the Soviet people. Andrey, a young guide in Moscow, Natasha, a Leningrad librarian, and Nina, a Novosibirsk hotel floor lady—all responded in a genuine way that symbolized to me a depth of human spirit that goes beyond culture or customs or language.

A short flight on the Soviet airline, Aeroflot, took us from Moscow to Leningrad, a city distinguished by its elegant palaces and numerous waterways. In Leningrad, we visited several libraries, with the most memorable being the library of the Komarov Botanical Institute, one of the premier botanical institutes in the world. The librarians were quite proud to show us many rare botanical volumes, including original art and books that can be seen nowhere else in the world. As with many other Soviet gardens, the gardens at the Komarov, while being beautiful, also serve the purpose of plant introduction and acclimatization.

Just when we thought we were getting used to the new sights, we left Leningrad (on the midnight flight) for Novosibirsk, a city located in western Siberia. Just south of Novosibirsk is Academic Town, a small town built specifically for scientific research. Unlike any preconceived ideas I had formed about Siberia, Academic Town has the relaxed ambiance of a resort area. Located on the Ob River, it was a scene of people relaxing on the beach and playing in the water, women selling flowers along the sidewalks, and lots of families walking through town or in the several natural and cultivated woodlands. A large portion of Academic Town is occupied by the 2,618-acre Central Siberian Botanical Garden (CSBG). The CSBG includes a large arboretum, 790 acres of botanical expositions, and a park where the vegetation is preserved in native ecological settings. We worked in the library, which has a small, well-organized collection, and we toured the parts of the Garden that serve as a laboratory for the introduction of ornamental plants from other countries, including the United States.

After a week in Novosibirsk, we returned to Moscow, this time seeing and appreciating it in a new way. Visits to the Central Scientific Agricultural Library, the State Lenin Library (one of the ten largest libraries in the world), the Biology and Soils Library of Moscow State University, as well as several more visits to the Main Botanical Garden, confirmed what we had sensed from our first moments in the Soviet Union: that it is a fascinating place with remarkable flora, libraries and people.

My thanks go to everyone who helped make this trip a success, with special thanks to Tom Elias for inviting MBG and NYBG to participate in the exchange program, Mrs. J. S. McDonnell and the Harry and Flora D. Freund Memorial Foundation for financial support, and of course, the Soviet people for their hospitality. A report on the trip that provides more detail concerning the libraries visited can be obtained by calling Kathy Brugere at the Garden at 577-5155. A slide show based on the trip is scheduled for April 12, 1988 in the Shoenberg Auditorium.

Postscript: Three Soviet botanists, Dr. Alexei Skvortsov, Dr. Rimma Karpisonova, and Dr. Pyotr Gorovoy, visited the United States in September as part of the exchange program. After visiting NYBG, New Hampshire, and Harvard University, they came to the MBG for one week. They were accompanied on a collecting trip to Springfield, worked in the herbarium and library, toured the horticultural areas, and saw some of St. Louis. We look forward to future exchange trips which may include Soviet information specialists as well as botanists.

—Constance P. Wolf, Librarian

Ask the Answer Service

Getting Ready for Winter

Do you have a plant question? Call the Horticultural Answer Service, Monday through Saturday, 9 a.m. to noon, at ***577-5143.***

Q. I'm usually able to control most weeds in my lawn, but seem to have a lot of trouble with chickweed. How can I rid my lawn of this pest?

A. As with any weed, the best way to control chickweed is by maintaining a healthy, vigorous turf. Chemical control should be thought of as a last line of defense behind proper care and maintenance. Annual (common) chickweed and its perennial cousin, Mouse-eared chickweed, are cool-season weeds and chemical control can be effective only when they are actively growing. Herbicides such as 2,4-D, dicamba, MCPP and Trimec applied in early November work well. Some of these formulations may harm ornamental trees and shrubs, so read the label for safe and proper use.

Q. Is it too late to plant tulips?

A. Tulips should not be planted until the soil has cooled after summer heat. Early November is an ideal time to plant them.

Q. Should I remove iris leaves in the fall or leave them until spring?

A. Remove and destroy the spent iris leaves after we've had a killing frost. Doing so will help control the iris borer. This moth lays its eggs on old leaves in the fall. The eggs winter over on the spent foliage and, after hatching in spring, tunnel into the rhizome, where they may do considerable damage.

Q. My Schefflera plant grew so large this summer there is no room for it in the house. If I cut it back, will it live?

A. Yes, Schefflera may be cut back and will continue to grow. New shoots will rise from the crown or from just below pruning cuts made at buds or leaf joints. Regular pruning will keep plants compact or will reshape tall plants that have lost their lower leaves. Visitors to the Garden can study the Schefflera growing in Monsanto Hall to observe proper pruning techniques. These large planters have been cut back many times, and retain a compact form.

Q. I planted some new azalea's last spring. Is there anything I should do to protect them this winter?

A. Most importantly, don't let the plants enter winter in a dry state. Evergreen azaleas may still need to be watered in winter if the soil is dry and unfrozen. Winds cause plants to lose moisture through their leaves and if water is unavailable in dry or frozen soils, "winter injury" may occur. Spraying the foliage in fall with an anti-transpirant will slow the loss of moisture. Placing a burlap screen on the windward side (NW) of the plants will give added protection.

Q. I planted a new perennial bed this fall. How should I "winterize" it?

A. Tidy up your perennial bed when growth ceases. Cut back dead foliage. Water thoroughly, if necessary, before the ground freezes. However, soil should not freeze up in a soggy condition. After ground freezes apply a loose mulch that will not smother your plants. The object is to keep the ground frozen until spring. This prevents freezing and thawing that may leave plants out of the soil and expose roots and crowns to drying winds.

Q. When should I mulch my roses?

A. Roses should be mulched after their growth has been stopped by a killing frost, but before the ground has frozen. Dirt works best and should be taken from someplace in the garden other than between roses to avoid damaging their roots. Pile the soil so it stands about 8 to 12 inches deep over the center of each plant. Pruning long canes back to about 18 inches makes it easier to apply mulch. Other mulching materials that may be used are finished compost leaf mold, aged manure, wood chips, bark mulch, leaves or straw.

Q. I brought my Wax begonias in from the garden this fall. They grow well for a while but have now developed a white powder on the leaves. What is happening?

A. Your begonias have a powdery mildew fungus. This disease develops under humid conditions. Avoid misting the foliage or splashing water on the leaves. Pick off and destroy any infected leaves before the fungus spreads. Benlate (Benomyl) fungicide applied according to label directions will be helpful. Severely infected plants should be discarded. Grow Wax Begonias indoors in a bright sunny window where there is good air circulation. Night temperatures in the 50s and warm days are preferred. Allow the soil to dry somewhat between thorough waterings.

Q. I dug up my geraniums in September and have been growing them in pots indoors. Now all their lower leaves have fallen off and they look like sticks. Can I cut them back?

A. Leggy plants can be cut back severely and new growth will sprout from the base. Geraniums can be wintered indoors but it is most important to be careful not to overwater them. They should be watered just often enough to keep the plants from wilting. Geraniums should receive at least a half day of sunshine to grow well.

TIMELY TIPS:

- Continue mowing lawns until growth stops.
- Rake and remove fallen leaves to prevent smothering lawn grasses.
- After lawn care ceases, have mower blades sharpened and general maintenance performed.
- Collect fallen leaves into large piles where they may decay into leaf mold or stockpile them for use in making compost.

—Chip Tynan, The Answer Service

Don't miss Chip on the KXOK Garden Show (AM 630) each Saturday from 8 to 9 a.m.

NOVEMBER-DECEMBER

DAY-BY-DAY

NOVEMBER

1 **KFUO-FM Concert**
1 p.m., Sun., Shoenberg Auditorium. Live radio concert by Manuel Ramos and Becky Boyer on violins, Catherine Lehr and David Ellis on cello, and Chris Woehr on viola playing music by Schubert. Free.

1 **Walking Tour**
2 p.m., Sun., Garden grounds. Enjoy the many colors of fall on a stroll of the grounds led by Garden Guides. Free. Call 577-5140 for reservations.

2 **Plant Clinic**
9 a.m. to noon, Mon., Ridgway Center. On-the-spot identification of indoor plants and diagnosis of their insect, disease and cultural problems. Free.

3 **Gardens of the World**
1:30 and 7:30 p.m., Tues., Shoenberg Auditorium. First of three lectures in November on different gardens of the world, today's lecture is titled "Gardens of China," presented by David H. Engel, landscape architect with Engel/GGP Landscape Architecture in New York City. $2 at door for Members, $3 for non-members.

4-6 **Holiday Preview Sale**
9 a.m. to 8 p.m. Wed. & Thurs., 9 a.m. to 5 p.m. Fri. Garden Gate Shop. 20% discount to Members.

8 **KFUO-FM Concert**
1 p.m., Sun., Shoenberg Auditorium. Live radio concert recital by David Ellis on the cello. Free.

10 **Gardens of the World**
1:30 and 7:30 p.m., Tues., Shoenberg Auditorium. Second of three lectures in November on different gardens of the world. Today's lecture is titled "Gardens of Japan," presented by Paula Kipnis, senior Missouri Botanical Garden guide. $2 at door for Members, $3 for non-members.

15 **KFUO-FM Concert**
1 p.m., Sun., Shoenberg Auditorium. Live radio concert by the St. Louis Baroque Ensemble with tenor Willard Cobb. Free.

16 **Plant Clinic**
See Nov. 2 for details.

17 **Gardens of the World**
1:30 & 7:30 p.m., Tues., Shoenberg Auditorium. Last of three lectures in November on different gardens of the world. Today's lecture is titled "Gardens of a Golden Age" (historic American gardens), presented by Eleanor Weller, co-chairperson of the Garden Club of America committee on American Landscape Design. $2 Members, $3 non-members.

18 **Members' Senior Day**
10 a.m. to 3 p.m., Wed., Shoenberg Auditorium. Hear the real story of the infamous romance and marriage of the Duke and Duchess of Windsor. Noted book reviewer, Elizabeth Ahlering will review "Wallis and Edward Letters 1931-1937: The Intimate Correspondence of the Duke and Duchess of Windsor," edited by Michael Bloch. The review will take place in the Shoenberg Auditorium at 10 a.m. Eat lunch in the Gardenview Restaurant and then . . . get the facts! Don't rely on the latest diet fads—come hear Jeanne Downey, clinical dietician for St. Lukes West Hospital, speak at 1:00 p.m. on basic nutritional needs for adults and why nutritional needs change as we get older. No reservations are required for either session, however, seating is limited to 380 people. For Members Only.

22 **KFUO-FM Concert**
1 p.m., Sun., Shoenberg Auditorium. Live radio concert recital by Becky Boyer on the violin and Patti Wolf on the piano. Free.

25 **Members' Preview of Holiday Vignettes**
5:30 p.m. to 8 p.m., Ridgway Center. A special peek at the exciting holiday show. Fr. William B. Faherty, author of "Henry Shaw—His Life and Legacies" will be available to autograph his new book. For Members only.

26 **Holiday Vignettes**
9 a.m. to 5 p.m. daily, Ridgway Center. Some of St. Louis' very best visual merchandisers from Dillards, Famous-Barr, Neiman-Marcus and Saks Fifth Avenue will create holiday magic in Monsanto Hall. *Through January 3.*

29 **KFUO-FM Concert**
1 p.m., Sun., Shoenberg Auditorium. Live radio concert featuring soprano Linda Hohenfeld accompanied by her husband Leonard Slatkin on the piano. Free.

DECEMBER

5 **Members' Holiday Decoration Demonstrations**
11 a.m. and 2 p.m., Sat., Shoenberg Auditorium. Learn how to make beautiful holiday decorations using natural materials from your own backyard. Gifted floral designer, Jodie Delf of St. Albans Farms will show you how to design a deer covered with honeysuckle vine, pine cones, mosses, ribbons and real antlers. This same deer will appear in the December issue of *House Beautiful*. Other decorations include a boxwood swan and Teddy Bear made of apples, cinnamon sticks, and ribbons. No reservations required for either session; however, seating is limited to 380 people. For Members Only.

6 **Walking Tour**
2 p.m., Sun., Garden grounds. Enjoy the Garden at a special time of year with a stroll of the grounds led by Garden Guides. Free. Call 577-5140 for reservations.

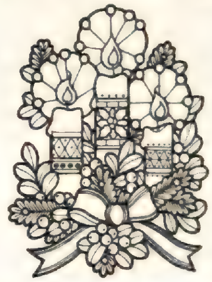
7 **Plant Clinic**
See Nov. 2 for details.

9 **Tower Grove House Candlelight Tour**
4:30 to 7:30 p.m., Wed., Tower Grove House. Fifth annual candlelight tour of Henry Shaw's country home decorated for the holidays. $5 per person. Advance reservations required by calling 577-5150. Sponsored by Tower Grove House Auxiliary.

9 **Supper With Santa**
5 p.m. & 6:15 p.m., Wed., Gardenview Restaurant. Enjoy dinner with Santa along with puppets, mimes, clowns and more. $10 per person. Advance reservations required by calling 577-5125, beginning December 1.

10–12 **Holiday Plant Sale**
9 a.m to 7:30 p.m., Thurs., 9 a.m. to 5 p.m. Fri. & Sat., Garden Gate Shop. 20% discount off all items to Members.

11 **Holiday Luncheon**
11:30 a.m. to 1 p.m., Tower Grove House. First of five holiday luncheons during December in the Tea Room of Henry Shaw's country home. $7.50 per person. Advance reservations required by calling 577-5150. Sponsored by Tower Grove House Auxiliary.



12 **Santa Lucia Celebration**
11 a.m. to 5 p.m., Sat., Ridgway Center. Festivities honoring the Swedish Saint Lucia who brings light, hope and peace to all. Activities include carolers, folkdancing and a candlelight procession. Free. Sponsored in conjunction with the Swedish Council of St. Louis.

13 **MoBot Fun Day**
1 p.m. & 2:30 p.m. Sun., Shoenberg Auditorium. A special fun day just for members of the MoBot Club. The famous Bill & Doug Kincaid Puppets will entertain.

14 **Holiday Luncheon**
See Dec. 11 for details.

15 **Holiday Luncheon**
See Dec. 11 for details.

16 **Holiday Luncheon**
See Dec. 11 for details.

17 **Holiday Luncheon**
See Dec. 11 for details.

20 **Sounds of Christmas**
11 a.m. to 3 p.m., Sun., Ridgway Center. Holiday performances by local musicians and carolers. Free.

21 **Plant Clinic**
See Dec. 7 for details.

25 **Christmas Day**
The one day of the year when the Garden is closed.

NOVEMBER-DECEMBER

COURSES & LECTURES

AT THE GARDEN

NOTE: Class descriptions and registration information for fall courses can be found in the *1987 Fall Courses and Lectures* brochure which was mailed to all Members. For more information call the Education Division at 577-5140.

NOVEMBER

4 (W)	Plants and Nutrition —Clarkson *(4 sessions)*
7 (Sa)	Flower Garden Design —Clarkson *(4 sessions)*
10 (Tu)	Growing Plants Indoors
11 (W)	Hollies
14 (Sa)	Plymouth Rock
17 (Tu)	Korean Cuisine *(2 sessions)* Foliage Plants
18 (W)	Herb Gardens of the Eastern U.S.
19 (Th)	St. Louis' Private Places
24 (Tu)	Flowering Indoor Plants
28 (Sa)	Winter Botany *(2 sessions)*

DECEMBER

5 (Sa)	Family Wreath Making
6 (Su)	Home Orchid Culture
10 (Th)	Della Robbia
11 (F)	Wreath and Centerpiece Workshop
12 (Sa)	Wreath and Centerpiece Workshop

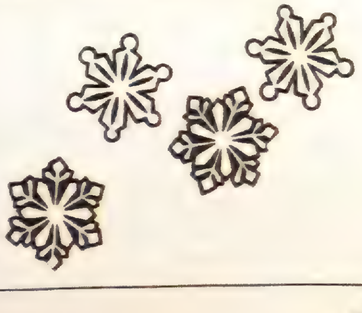
AT THE ARBORETUM

NOVEMBER

6 (F)	Nocturnal Awareness Hike
13 (F)	Nocturnal Awareness Hike
14 (Sa)	Finding Your Way With Map and Compass

DECEMBER

4 (F)	Nocturnal Awareness Hike
11 (F)	Nocturnal Awareness Hike



Designer of Japanese Garden Honored

Koichi Kawana, left, receiving Henry Shaw Medal from John Biggs.

Koichi Kawana, designer of Seiwa-En, the Missouri Botanical Garden's world-renowned Japanese Garden, received the Henry Shaw Medal on September 16. The presentation was part of the annual dinner for Garden Fellows and Henry Shaw Associates, the leading supporters of the Garden.

The Henry Shaw Medal has been awarded intermittently since 1893. It honors those who have made significant contributions to the Missouri Botanical Garden, botanical research, horticulture, conservation, or the museum community.

"Thanks to Koichi's hard work and expertise, Seiwa-En became a reality in May of 1977," said Garden Director Peter H. Raven. "And now, ten years later, the Japanese Garden is still the largest and most authentic of its kind in North America, and one of the most popular attractions with visitors. He's very deserving of this award."

"In designing Seiwa-En and overseeing its installation, Koichi Kawana gave us a truly wonderful space, full of serenity and remarkable vistas," said John H. Biggs, president of the Board of Trustees, upon presenting the award to Kawana.

Kawana is a professor and lecturer of environmental design, Japanese landscape architecture and Japanese art at the University of California at Los Angeles (UCLA). He is also founder and chairman of Environmental Design Associates, a Los Angeles-based company.

Kawana has designed several other well known Japanese gardens in the United States, including ones at the Chicago Botanic Garden, at the Donald C. Tillman Water Reclamation Plant in Los Angeles, and at the Denver Botanic Gardens.

The multi-talented Kawana is listed in the current edition of "Who's Who In America," and is an award-winning artist. Several of his paintings have been included in the White House collection, the Grunwald Graphic Arts Foundation collection and others. He has also been a technical advisor on several motion pictures, including "Around the World in 80 Days."

Born in Hokkaido, Japan, Kawana was naturalized as a citizen of the United States in 1971. He received a doctorate in 1979 from Pacific Western University in Los Angeles, a master of arts degree in 1959 from UCLA, and a bachelor of science degree in 1951 from Yokohama Municipal University in Japan.

JACL DONATION: During the opening ceremonies of this year's Japanese Festival, the St. Louis chapter of the Japanese American Citizens' League (JACL) donated $1,000 to the Garden for improvement and maintenance of the Japanese Garden. Garden Director Peter Raven, above center, gratefully accepts the check from JACL President George Sakaguchi, left, and Sam Nakano.

$177,500 GIVEN FOR CLIMATRON WINDOWS

The Missouri Department of Natural Resources has approved the Garden's request for $177,500 to assist in the replacement of the plastic outer skin of the Climatron with the energy efficient glass. The Garden's request was one of 38 accepted out of 162 applications this year for monies from a special fund set up for energy conservation projects around the state.

The money for the project comes from a $2.1 billion refund ordered by the U.S. Department of Energy from Exxon Oil Corporation for overcharging consumers nationwide during the period of federal price controls in the 1970s. Missouri's share is approximately $42 million to be spread out over five years. Six million dollars is available for distribution in 1988 in the state. Requests for a wide variety of energy conservation projects totaled $23,064,186.

When work begins on the Climatron next year, all 3,625 panes of Plexiglas will be replaced with "Low E" glass, a laminated glass that will help reduce heating bills by retaining the solar energy captured during the day for heating at night.

Garden Receives Grant for Colombian Project

The Garden has received a grant of $7,046 from the World Wildlife Fund to support a botanical study in Colombia called "A Floristic Inventory of La Planada and the Adjacent Zone," effective through April 1, 1990. La Planada is located in southwest Colombia.

The project is a cooperative effort between the Missouri Botanical Garden and the University of Narino, Colombia. It will be coordinated by Dr. Alwyn H. Gentry, a curator in the Garden's tropical botany research program, and by Olga de Benavides, a professor at the University of Narino.

The primary goal of the project is to provide a floristic data base that can be used for conservational planning. Secondary botanical and ethnobotanical studies will also be done. The flora of the region is virtually unstudied, but preliminary investigations have shown that it is perhaps one of the richest areas in terms of number of plant species in the American tropics.

Garden Represented at Botanical Congress in Berlin

The Fourteenth International Botanical Congress took place in Berlin, West Germany from July 24 to August 1. The Missouri Botanical Garden was represented at these important meetings by a delegation of 21 people that included the director, several curators, research associates, post-doctorals and graduate students. The photograph above was taken outside the International Congress Centrum. Shown from left to right are Dr. Nancy Morin, Dr. and Mrs. Walter Lewis, Dr. Al Gentry, Dr. Mary T.K. Arroyo, Dr. Jim Zarucchi, Dr. Robert Magill, Dr. Porter P. Lowry, Dr. George Schatz, Dr. Michael Grayum, Bruce Stein (graduate student), Dr. Carol Todzia (post-doctoral), Dr. Jim Beach (post-doctoral), Dr. Peter Raven, Dr. Barry Hammel, Dr. Tom Croat, Dr. Enrique Forero (Director of Research), Dr. M. R. Crosby, Dr. Robbin Moran (post-doctoral). Absent from the photograph are Dr. and Mrs. William D'Arcy who, together with Drs. Crosby, Forero and Morin, attended the Nomenclature sessions prior to the Congress as well as the Congress sessions.

Garden's Teacher Training Program Now In the British Virgin Islands

The Garden's education division's in-service teacher efforts have now been expanded to the British Virgin Islands (BVI). At the invitation by the Ministry of Education of the BVI, Dr. Ken Laser, chairman, conducted a preliminary in-service teacher training workshop in Environmental Education on the Island of Tortola, August 10-15, 1987. Members of the workshop included invited school administrators and key teachers from the island schools of Tortola, Virgin Gorda and Anegada. Their purpose was to learn Dr. Laser's in-service training methods and activities in environmental sciences and to design a two-year training program for BVI teachers beginning in August, 1988, contingent upon funding.

The workshop is based on Laser's model that was designed and implemented while he was on the faculty at the State University of New York at Stony Brook. It was then taken to Costa Rica at the invitation of OTS, (the Organization of Tropical Studies) and subsequently brought to teachers of St. Louis and is funded for three summers by a grant from the National Science Foundation. A unique feature of the model is its practical use of local resource sites for teachers K-12, using a multidisciplinary approach, and combining the newly learned concepts with local curricula and well established environmental sciences curricula in the U.S.

At the workshop, the participants used the newly opened BVI Botanic Garden and local school resources to conduct their activities in a natural setting. They were also exposed to numerous activities of the Garden's youth, Suitcase Science and ECO-ACT programs and are redesigning some of these to use in their own school curricula.

BVI residents, Paulina DuPont Dean, president of the BVI Botanical Society, and Carolyn Lindsey, president of the American Horticultural Society, met Laser as tour guides on an AHS and Members' tour of the "Gardens of the Virgin Islands" this past January. They were convinced that his teacher training program could have a significant impact on the BVI environment primarily by providing teachers with specific in-service training in environmental education, including model activities teachers can use with their students.

Laser hopes to take along one St. Louis teacher who has been trained in the Garden-based project to work with the BVI teachers. Currently the project is contingent upon funding. Anyone having interest or questions about this project should contact Dr. Laser at 577-5139.

MAGICAL COSTA RICA— GEM OF THE AMERICAS

Join Missouri Botanical Garden for its first trip of the new year, January 16-27, 1988, to a country known as the Gem of the Americas. Costa Rica, a country of peaceful and friendly people, is nestled between the beautiful Caribbean Sea and the Pacific Ocean. The country offers an environment abundant with spectacular flora and fauna and a rich history of distinctly different cultures. Verdant cloud forests, warm azure seas, jade and gold museums and rhythmic Latin music all await Missouri Botanical Garden Members who participate in January's Costa Rican tour.

Six nights will be spent in San Jose, the capital of Costa Rica. Garden Members will be guided on private tours of the National, Gold and Jade museums. Escorted by Missouri Botanical Garden research botanist Mike Grayum, we'll meet with several important conservationists including Alvaro Ugalde, director of the National Parks Foundations. Two nights are scheduled in a mountain lodge near the Monteverde Cloud Forest Reserve and three nights at the Marenco Biological Station near the Corcovado National Park, offering the opportunity to explore the diversity of ecological zones and abundant animal and bird life. We've also included a day trip to a sunny Pacific Ocean island and a scenic narrow gauge train ride.

This unique 12-day trip highlights the natural wonders, cultural riches and captivating beauty of Costa Rica. Join us on our very special visit to the land where 'enjoy life' is more than a philosophy. Only 22 Missouri Botanical Garden Members will be able to participate in this program, so make plans now to join us. Call Dana Hines, 577-5108, to be part of this magnificent experience.

Henry Shaw Biography and Autographing Engagement

Father William Barnaby Faherty, author of the newly released biography *Henry Shaw—His Life & Legacies*, will be on hand to autograph copies of this historic book, at the Members' Holiday Preview, November 25, 1987, from 5:00 to 8:00 p.m.

Volunteer News

Eight New Garden Guides

Welcome and congratulations to the latest class of Missouri Botanical Garden Guides, pictured above left to right, Fred Winterowd, Maripat Monterubio, Elizabeth Stevenson, Helen Hilliker, Sally Morse, Diana Rothbarth, Betty Guarria, and Barbara Windsor! The new Guides have been trained by a new mentor system, along with on-the-job training, designed and implemented by Linda Gwyn, Maurita Stueck and Joanna Werner, also volunteer guides. The Garden Guides are composed of 68 talented and enthusiastic volunteers who lead school and adult groups on informative tours of the Garden's many features.

Special Projects Volunteers

In addition to the volunteers who come in on a regular basis there are 125 special project volunteers who work as the need arises. They collect tickets, register workshop participants, assist in demonstrations, take surveys and handle bulk mailings.

On a big event, such as the Japanese Festival, volunteers will often work two or more shifts and attend training and orientation sessions. During the 1987 festival 107 volunteers staffed 190 shifts. Some of the more unusual tasks they have performed throughout the year have included wearing Victorian costumes and passing out flower seeds, serving as elf assistants to Santa Claus and dethorning roses for Members Rose Evening.

Many of the special projects volunteers are employed outside the home so evening and weekend events fit in well with their schedules. They are enthusiastic, fun spirited and really enjoy public contact. Because of their help the Garden is able to offer interesting and exciting public programs.

INDOOR PLANT CLINIC: Get on the spot identification indoor plants and diagnosis of insect, disease and cultural problems at the Missouri Botanical Garden Indoor Plant Clinic. The clinic operates on the first and third Mondays of each month through March in the Ridgway Center. Hours of the clinic, which are staffed by Missouri Botanical Garden/Missouri Extension Service Master Gardeners, are 9 a.m. to noon. Free.

Tower Grove House Ready for the Holidays

Tower Grove House will again be decorated in Victorian splendor for the holidays and open to visitors from Tuesday, December 8 through Thursday, December 31 from 10 a.m. to 4:30 p.m. The home and the Garden will be closed Christmas Day.

The Fifth Annual Candlelight Tour, sponsored by the Tower Grove House Auxiliary, will be held on Wednesday, December 9, between 4:30 and 7:30 p.m. Reservations may be made by mailing in the form below. For additional information call Tower Grove House, 577-5150. The fee includes a candlelight tour of the decorated house, plus refreshments in the Tea Room. Enter at 2345 Tower Grove, where your name will be registered. Parking is available across the street at Tower Grove Baptist Church.

Tower Grove Auxiliary's Tea Room will again have special holiday luncheons on Friday, December 11; Monday, December 14; Tuesday, December 15; Wednesday, December 16 and Thursday, December 17, 1987 between 11:30 and 1 p.m. Guests will be greeted with holiday punch. Reservations must be confirmed.

For additional information and reservations call 577-5150.

Please make____________reservations for the Candlelight Tour, Wednesday, December 9, Tower Grove House between 4:30 and 7:30 p.m. ________at 4:30 p.m.________at 6:00 p.m. Enclosed is my check for $________, at $5.00 per person. Please make checks payable to: Tower Grove House Auxiliary.

NAME________________________

ADDRESS______________________

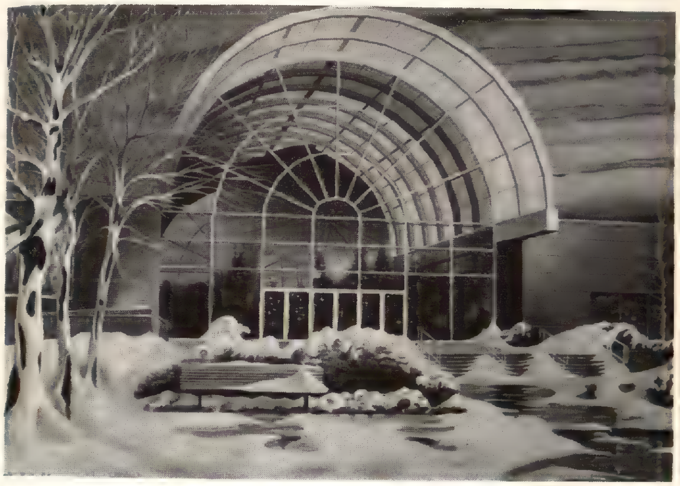
CITY________STATE________ZIP________

PHONE_______________________

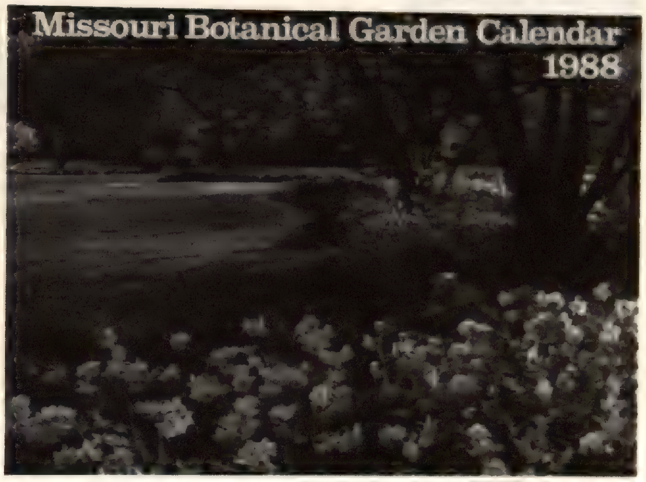
Mail to: Tower Grove House,
P.O. Box 299, St. Louis, MO 63166

From the Garden Gate Shop

Holiday Happenings



1987 Holiday card



1988 Garden calendar

Annual Holiday Preview Sale

Nov. 4 & 5 — 9:00 a.m. to 8:00 p.m.
Nov. 6 — 9:00 a.m. to 5:00 p.m.

All merchandise, including the finest in books, gifts, plants, gardening tools, and holiday decorations, will be available to Members at a 20% discount. We have the spectacular 1988 Missouri Botanical Garden Calendar and a beautiful 1987 Missouri Botanical Garden Holiday Card. There are hundreds of wonderful gifts to select at the Garden Gate Shop. Gift Certificates are also available.

December Plant Sale

Dec. 10 — 9:00 a.m. to 7:30 p.m.
Dec. 11 & 12 — 9:00 a.m. to 5:00 p.m.

Now is the time to purchase holiday plants, garden related gifts and decorations from the Garden Gate Shop at 20% savings. Included are such colorful plants as poinsettias, Christmas cacti and decorated live miniature pine trees. Choose from a fascinating collection of holiday baskets plus unique baskets for every occasion. Birdfeeders in a wide assortment of styles and prices make great gifts. Amaryllis bulbs, fragrant paperwhite narcissus kits, and other indoor bulb kits are available for holiday blooming. Gifts for the avid gardener include fine tools, gloves, chimes, sundials and statuary.

Cards and Calendars

Holiday shoppers will be pleased to hear that Missouri Botanical Garden Christmas cards and 1988 calendars are on sale now in the Garden Gate Shop.

The 16 inch by 12 inch full-color calendar features 37 photographs by St. Louisan Jack Jennings. The calendar lists hundreds of historical facts about the Garden, St. Louis, botany and the United States. A color poster describing the Garden's role in the study of orchids is included as well. Calendars are only $9.95 each, with the proceeds benefiting the Garden.

The card features a holiday view of the back of the Ridgway Center created by St. Louis artist Dhimitri Zonia. The scene is taken from an oil painting by Zonia titled "Morning." Cards can be purchased with no message or with the wording, "Peace and Joy in the New Year." A package of 10 Garden holiday cards and envelopes are $9.95.

Book Review

A special gift for book lovers this holiday season is *The Complete Flower Paintings and Drawings of Graham Stuart Thomas* (Abrams, $45.00). One of Britain's foremost horticulturists, Graham Stuart Thomas has also developed a reputation as an artist of great talent. His paintings and drawings have received the Royal Horticulture Society's Gold Medal.

In this volume, all of Thomas's paintings and drawings are presented together for the first time. The 175 illustrations (58 in full color) are accompanied by detailed commentaries on the flowers depicted. Also included is an essay on flower illustration which provides further insight into Thomas's extraordinary career in horticulture.

This lovely book promises to be one of the best on botanical art to appear in a long time. Remember your favorite book lover with a copy for the holidays.

1988 Calendar Order Form

Please send me __________ Missouri Botanical Garden Calendars at $9.95 each (plus $2.00 postage and handling).

NAME ______________________________

ADDRESS

CITY ________ STATE ________ ZIP ________

TELEPHONE __________________________

☐ Enclosed is my check for $______________
Payable to: Missouri Botanical Garden

☐ Please charge:
VISA/MC No. ______________________

Expiration date ____________________
Name as it appears on card:
____

Mail to: Missouri Botanical Garden
Garden Gate Shop
P.O. Box 299, St. Louis, MO 63166

From The Gardenview Restaurant

Ces & Judy's Green Tree Gourmet will again be offering their special gift baskets for the 1987 Holiday Season through the Gardenview Restaurant. Each Holiday Basket will include six mini-loaves of homemade banana nut, poppy seed and pumpkin breads. The price is $8.50 per basket. Personalized gift baskets can be ordered. They will also be featuring Henry Shaw's private label red and white wines and this year are introducing a new private label champagne. The wine and champagne are produced at the Mount Pleasant Winery in Augusta, Missouri, and are priced at $8 and $10 a bottle respectively. Any of these items can be ordered by calling Pat McManus at 577-5119.

For Younger Members

Evergreens and Conifers

The holidays are coming and with their arrival come the wonderful sights and scents of the season. Close your eyes and just imagine yourself in a room filled with holiday decorations. Now take a deep breath and sniff those wonderful aromas. What did you smell? Some cinnamon rolls baking, cranberries bubbling, and overall that wonderful fresh scent of evergreens.

Evergreens have been a holiday tradition for centuries. Early European churches used evergreen wreaths to indicate eternal life. The wreath in a circle represented never ending and the green symbolized always living.

Evergreen is a broad term that describes all trees that remain green or hold their foliage even when dormant in the winter. When most people think of an evergreen, they picture a pine or spruce tree, but a camellia is also an evergreen. Evergreens can be divided into two groups. The first is broadleaf evergreens which include any tree with wide leaves that remain green all year. The second group are the conifers. These include trees like the blue spruce and juniper. The name conifer is given to these plants because they have cones that produce their seeds.

Conifers may be evergreens but not always. A few of the conifers look like an evergreen in the summer but during the winter they lose their needles just as a maple tree loses its broad leaves. They are called deciduous trees. You can see two of these trees at the Garden. They are the Dawn Redwood and the Bald Cypress. How do you think the Bald Cypress got its name? Could it be because it goes bald in the winter?

If you get mixed up about evergreens and conifers, just remember an evergreen is any kind of tree that keeps its leaves all year. A conifer is a special tree that has needle-like leaves and grows its seed in cones.

Next time you take a walk in the Garden take a look at the trees. In the winter it is easy to pick out the evergreens. Look closely at each tree that is green and take along this list to help you decide if it is a broadleaf evergreen or an evergreen conifer.

1. Does it have green leaves?
   Yes__________No__________
2. Does it have needle-like leaves?
   Yes__________No__________
3. Does it have cones?
   Yes__________No__________

If you answer yes to all three it is an evergreen conifer. If you can only answer yes to the first question, take a close look at the leaves. If they are wide leaves then you are looking at a broadleaf evergreen.

You might want to give your Christmas tree this test. With a little practice you will soon be a conifer expert.

ACTIVITY / *Evergreen Wreath*

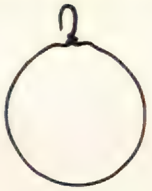
Every year your dad or mom has to cut a few branches off the tree to "spruce it up." This year save the clippings and make an evergreen wreath.

Materials:

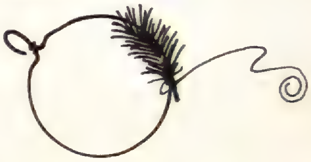
Red bow
Wire coat hanger
2 feet of thin wire
Clippings from your holiday tree

What to do:

1. Bend your coat hanger into a circle. Also bend the hook part down to a small circle.



2. Lay one stem of your evergreen on the hanger and wrap one end of your thin wire around to attach it. Be sure to allow the small branches to hang free to disguise the wire.



3. Then lay the second piece of evergreen over the first. Continue wrapping the thin wire. Do not cut it.
4. Continue this process around the entire hanger frame, wrapping the wire over the evergreen cuttings.
5. When you reach the end, securely fasten the thin wire then clip off the remainder. Attach the red bow to your wreath and proudly display it on your front door.

PLANT TALK FOR KIDS / *Squash and Pumpkins*

Although there has been considerable confusion over what constitutes a squash or a pumpkin, they both still remain widespread in cultivation and popularity as a food source. The word squash is derived from the American Indian word "askutasquash" and pumpkin from the Old English "pumpion or pompion". Squash and pumpkins, along with other plants of the gourd and melon family (Cucurbitaceae), are profuse in the varieties grown, and are herbaceous plants of great size, with long, vinelike and rough prickly shoots. They both belong to the genus *Cucurbita* which is composed of 25 species and numerous cultivars. All need considerable space to grow but very little attention during the growing season.

Of the nine cultivated species, five do not produce hybrid offspring and the four species that do are *Cucurbita pepo, C. maxima, C. moschata* and *C mixta*. As defined by the experts:

Pumpkins are the ripe edible fruits of any of four species that have strongly flavored, coarse flesh. These are rarely eaten as vegetables in the U.S.—but are used in pies or for livestock. In the tropics, they are cooked as vegetables and used in soups.

Summer Squash These are the edible fruits of any of four species—the most common are yellow or white "crookneck" (*C. pepo*) or straight varieties (Zucchini). These are eaten when immature.

Winter Squash are the edible ripe fruits of any of four species which have a mild flavor, a fine grain flesh, eaten as a vegetable or in pies and fed to livestock.

Cucurbita maxima originated in South America, but it wasn't until the 16th century that it was introduced into other parts of the world. It seems to be tolerant of cooler environments and the drier tropics. It includes such cultivars as the 'Hubbard' and 'Turban' squash. *Cucurbita pepo* includes the summer squashes, zucchini, ornamental gourds, the cultivar called the Acorn squash and the American pumpkin used in pumpkin pies and used at Halloween for making Jack-o-lanterns. *Cucurbita pepo* seems best adapted to drier tropical/Mediterranean climates. A popular cultivar of *C. moschata* is the "butternut" squash. The cultivars of this species seems sweeter than others, more adapted to hot/humid climates and more widespread in the tropics than other species. Many cultivars in the U.S. include those used for pies and baby food. *Cucurbita mixta* is less cultivated than other pumpkins and squashes because its fruits tend to be watery and fibrous. It originated in Mexico, where it is grown more for its edible seeds.

Kids' Tip:

All squash and pumpkins are chock full of carotenoids and about 500 carotenoids have been identified in winter squash cultivars. Beta carotene is one of the most important carotenoids because it eventually is converted into Vitamin A, an essential vitamin. Beta carotene is important as an antioxidant which helps protect our body's cells from 'free radicals' which is a form of unstable oxygen implicated in cancer. One half cup of cooked 'Hubbard' squash provides more than 100 percent of the required daily amounts for Vitamin A in the form of carotenoids.

Ken Laser, Ph.D.
Chairman, Education Division

RECIPE/ *Cream of Pumpkin Soup*

1 lb. pie pumpkin or sweet winter squash
2 cups milk
1 tsp. salt
1/2 tsp. white pepper
1 large onion (chopped)
2 T. margarine
2 T. flour
1 cup water

1. Steam pumpkin, remove skin and rub through sieve. Melt margarine, sauté onion. Stir in flour and add water, then add pumpkin and milk gradually. Add salt and pepper. Boil gently for 5-6 minutes.
2. Strain through a sieve, serve hot.
3. Add a dash of curry powder before serving.

Garden To Host St. Louis Science Educators' Symposium

The Garden has scheduled its fourth St. Louis Science Educators' Symposium on November 20 & 21 in the Ridgway Center. Approximately 200 local teachers in levels K-12 are expected to attend the fall conference entitled "Beyond the Classroom Window: Science in Our Lives."

The symposium will feature interactive professional workshops and displays, as well as discussions and networking events. Nationally recognized keynote speakers have been selected to inspire and challenge educators to present science as an integral part of everyday life.

The opening event on Friday evening will be a keynote address by Dr. Walter Lewis, biology professor at Washington University, and his wife Memory Elvin-Lewis, professor of microbiology at the same school. The Lewises will discuss their current research of significant medicinal plants in Amazonian Peru, and the importance of tropical plants to humans.

Saturday morning's keynote presentation will be given by Shiela Tobias, author, educator, and professor at the University of Arizona, Tucson. Tobias will discuss "What Makes Science Hard? Overcoming Anxiety in Math and Science." According to Tobias, we need to "seduce students into science by taking them on a tour through the various real life workshops where science is used."

For more information about participating in the event, contact Karla Goodman, manager of environmental education programs at the Missouri Botanical Garden, at (314) 577-5134.

Arboretum Recruits Help on Projects from Missouri Army National Guard

Shaw Arboretum has recruited the help of the Missouri Army National Guard (MOARNG) for a variety of projects. Work began September 12.

MOARNG, as part of its ongoing training program for its personnel, will work at the Arboretum one weekend per month through next spring. The services are considered training projects and are free of charge to local, state or federal agencies. The services are also free to not-for-profit organizations such as the Garden.

A variety of projects are planned by MOARNG, including demolishing several old greenhouses and unused buildings, filling in an obsolete concrete reservoir, repairing existing pond dams, constructing a new pond in the Native Grass demonstration area, and grading some roads.

Flora of Missouri Being Revised

The Missouri Botanical Garden and the Missouri Department of Conservation recently entered into a joint venture to revise Garden Curator Julian Steyermark's monumental *Flora of Missouri*, first published in 1963. George Yatskievych, a Conservation Department scientist, is directing the project.

The new edition will take advantage of the numerous distributional records accumulated during the past 25 years, as well as the large volume of scientific literature published during that time. Information for the new edition will also be incorporated into the Garden's computer data base where it will be available for use with the new Flora of North America project, which is based at the Garden.

Trustee Profile

SYDNEY M. SHOENBERG, JR.

Sydney Shoenberg smiles when he talks about the Garden. "It's wonderful that we have so many members and visitors," he said recently, "but then," he continued, "we should! There's so much to see, to do, to be proud of at the Garden."

Now finishing his fifteenth year as a Trustee, he understands the diverse nature of the Garden's activities. The family foundation has played a significant role in many of them. Display, education and research have all benefited from the Shoenberg Foundation.

Garden display over the years has been enhanced by two Shoenberg fountains; a classical circular one in the Gladney Rose Garden and the modern "triangle" at the south end of the Garden defining the space between the Lehmann and Administration buildings. The family's interest in education has been underscored by support for the auditorium in the Ridgway Center. Used for classes, lectures, and demonstrations by the Garden as well as community groups, it is one of the finest facilities of its type in the metropolitan area. It is also used for performing arts groups, giving the Garden the opportunity to serve yet other audiences.

Recent support for the book conservation center in the John S. Lehmann Building helped with renovation of the Garden's all-important research facility. The Garden's library, one of the finest botanical libraries in the world, is fortunate to have its own book conservation center for its many rare and valuable books.

Thinking about his service as Trustee, Mr. Shoenberg reminisced, "I am very proud of the growth the Garden has seen in the last 15 years and pleased that my family has been able to be a part of it. It is such a wonderful community institution."

Henry Shaw—His Life and Legacies

Founded in 1859 by Henry Shaw, the Missouri Botanical Garden is known to every St. Louisan for seasonal floral displays, the Japanese Garden and the Climatron and is recognized internationally as a research center. But few know much about Henry Shaw himself, the successful businessman who created "Shaw's Garden" and the 276-acre Tower Grove Park. While the Garden has always been open to all, Shaw's private life has, until now, remained closed.

After extensive research in Shaw's native England and at the Missouri Botanical Garden archives, Father William B. Faherty, S.J., in his biography of Shaw, examines the myths about this enigmatic man and brings new insight into Shaw's life and personality. At the same time, through the story of the man who founded it, he presents a colorful picture of one of the world's outstanding botanical institutions.

Henry Shaw, His Life and Legacies is an illustrated 288-page 6″ × 9″ book. Copies of this biography are available at the Garden Gate Shop for $29 each and can be signed by the author at the Members' Holiday Preview Party November 25.

Behind the Scenes

Mellitz Joins Garden as Assistant to Raven

Marcia B. Mellitz has joined the Garden's staff in the newly created position of Assistant to the Director. Working closely with Garden Director Peter H. Raven, she will perform a wide range of administrative duties.

Mellitz will actively participate in the decision-making process regarding Garden policies and long-range plans. She will regularly interact with other Garden staff, members of the Board of Trustees and community leaders, and will have the authority to make decisions in the director's absence.

Since 1983, Mellitz has been executive director of Operation Food Search, a not-for-profit organization that provides surplus food to community agencies in the St. Louis metropolitan area. This past year, she has been responsible for the distribution of $14 million worth of food (24 million pounds). Her efforts have received national acclaim in the Wall Street Journal and other publications.

Prior to joining Operation Food Search, Mellitz worked as an independent political consultant for a variety of candidates, issues, legislation, and appointed positions. She is currently on the board of directors of Theatre Project Company, KWMU radio and Leadership St. Louis.

Mellitz has a Masters of Business Administration degree from Washington University, and a Bachelor of Science degree in Microbiology from the University of Maryland. She conducted research in bacteriology for the Food & Drug Administration.

Botanist Observes 20th Year at Garden

Thomas B. Croat, Ph.D., P. A. Schulze Curator of Botany at the Garden, recently celebrated his twentieth anniversary as a member of the Garden's research staff. Dr. Croat specializes in the study of Araceae (the philodendron family), a taxonomically poorly known plant family. As part of his research he maintains the largest living collection of aroids in the world at the Garden. The collection consists of more than 6,000 individual plants.

His work takes him to Latin America three or four months out of the year where he collects new specimens for identification and study. Among his recent adventures have been trips to Mexico, Costa Rica and Venezuela to collect and write descriptions and keys to the Araceae for a variety of local flora projects.

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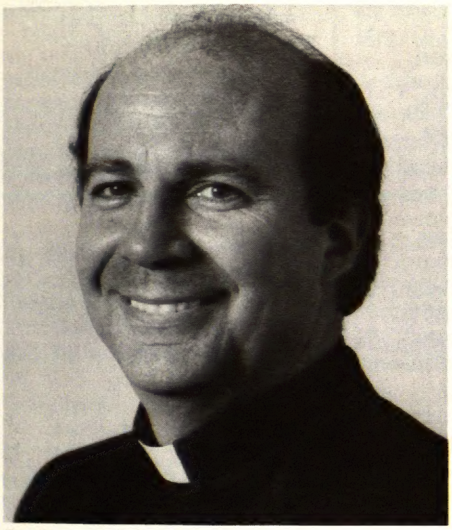
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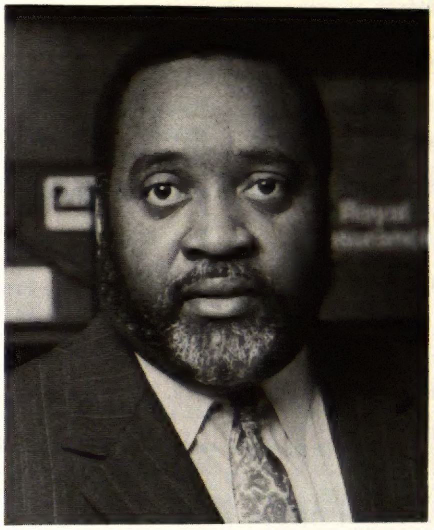
Richard K. Gaines

Two new ex-officio members have joined the Garden's Board of Trustees. Rev. Lawrence Biondi, S.J., the new president of St. Louis University, above left, replaces Rev. Thomas R. Fitzgerald. Also joining the Board is Richard K. Gaines, the new president of the St. Louis Public Schools Board of Education. He replaces John P. Mahoney. Both Father Biondi and Mr. Gaines serve as voting members of the Board of Trustees by virtue of the offices they hold as specified in Henry Shaw's will and subsequent court orders amending the will.

The Unseen Garden

Visitors to the Missouri Botanical Garden come to enjoy the magnificent horticultural displays, take a gardening class or two, attend a concert, see an art exhibit or just enjoy a peaceful walk. Few of the almost 700,000 people who enter the Garden yearly ever stop to investigate what goes on behind the mirrored glass walls of the John S. Lehmann Building at the south end of the grounds.

Within this building, and scattered in remote places around the world, Garden scientists are busy studying the plants of tropics in a race against time. Their important work is outlined in a new booklet, *The Unseen Garden*, which was mailed to all Members in September.

If you have not already done so, please take a few minutes to read through this beautifully illustrated booklet. Additional copies of the booklet are available in the Garden Gate Shop or through the development office at the Garden.

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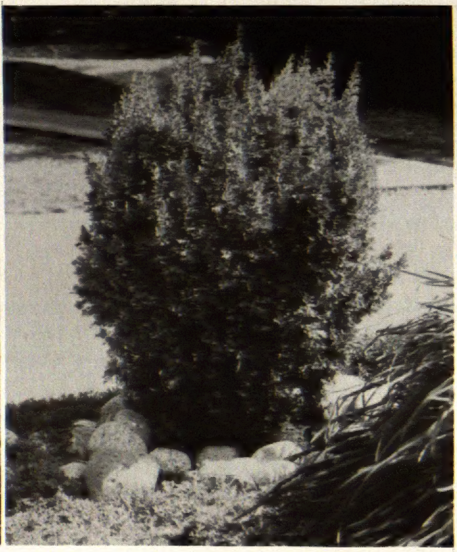
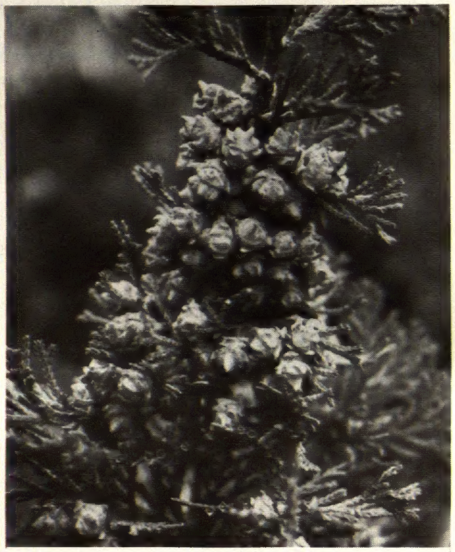
Dwarf Atlantic Whitecedar

Wild *Chamaecyparis thyoides* at edge of coastal bog in Massachusetts.


Chamaecyparis thyoides 'Andelyensis' in Rock Garden.


Cones and branchlets on 'Andelyensis.'

The genus *Chamaecyparis* is a heavyweight among ornamental conifers. Its foremost cultivated species are the Sawara Cypress (*C. pisifera*), the Hinoki Cypress (*C. obtusa*), the Alaska Cedar (*C. nootkatensis*), and the Lawson Cypress (*C. lawsoniana*). Dozens of cultivars trace back to these species. The approximately eight species making up the entire genus typically possess pyramidal or columnar shapes, usually flattened branches, and tiny scalelike leaves, which usually lie flat against the twigs. The cones are small globes with the scales attached at their middles like shields. The trees range in size from giants over 100 feet tall to potted dwarfs.

With one exception, the species inhabit lands around the Pacific Ocean, either in Asia or the Pacific Northwest. The exception stands apart forlornly as the Atlantic representation of the genus and as a minor presence in horticulture. The Atlantic Whitecedar (*Chamaecyparis thyoides*) is limited to coastal boggy-swampy sites from Maine to Florida. In some places it is found in sizable stands, and the individuals can become large with trunks exceeding two feet in diameter. The wood, which has commercial value, is remarkably resistant to decay and waterlogging. In New Jersey, trunks of Atlantic Whitecedar buried in muck for hundreds of years have been unearthed in fine condition.

Having an attractive columnar shape and a bluish cast to its foliage, *Chamaecyparis thyoides* found its way into European horticulture in the 18th century. Around 1850, a seedling of this species showing a unique, dwarf, compact form appeared in a nursery near Andelys, France. Its horticultural and commercial potential were perceived right away by French and British growers, who propagated and promoted the new selection under various names until different *Chamaecyparis* selections stole the show. Now known as *Chamaecyparis thyoides* 'Andelyensis' (the *-ensis* ending indicates "originating at"), this pleasing cultivar is thriving at the eastern edge of the Rock Garden. When you find it there be sure to see the small, blue-waxy cones on this little tree. Despite being upstaged by its Pacific relatives, it remains a delight.

—*George Rogers, Ph.D.*

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